Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

Vol. 4. New York, July 7, 1849. No. 42.

THE
Scientific American.
THE
BEST MECHANICAL PAPER IN THE WORLD.
CIRCULATION 13,000.
PUBLISHED WEEKLY.
At 128 Fulton Street, New York (Sun Building,) and 13 Court Street, Boston, Mass.
By Munn & Company.
The Principal Office being at New York.
Barlow & Payne, Agents, 89 Chancery Lane, London

TERMS---$2 a year---$1 in advance, and the remainder in 6 months.

Poetry.

To Mary.

BY JOHN H. WARLAND

Bounding, jumping, romping Mary !
Thy laugh so full of glee,
Why stoppest thou, my little fairy,
The gorgeous clouds to see ?
What vision bright, or sudden thought,
Hath hushed thy merry laugh and shout ?

Skipping, dancing, tripping Mary !
Fleet as the agile fawn,
Why leave the ring, where dance so merry
Thy playmates on the lawn ?
They call thee, but thou heed'st not---
The hoop and swing alike forgot.

Mirthful, playful, gleeful Mary !
Dost see the gates of heaven,
Where bathe the clouds, like phantoms airy,
The golden light of even ?
Charmeth some angel's form thine eye,
Who calls thee to thy native sky ?

Laughing, prattling, sporting Mary !
Now tell me what shall be
The tint of sky, sunlit or starry,
To which I'll liken thee !
The softest shades of heaven's own blue
Those lustre eyes seem melting through.

Blue-eyed, bright-eyed, blue-eyed Mary !
The rosy tints of even
Are woven in thy cheeks, my fairy,
Like the hues that melt in heaven !
The sweetest tint's at day's decline
Have not so sweet a blush as thine.

Blushing, blooming, blushing Mary !
To what shall I compare
The ringlets flowing, soft and airy,
Upon thy neck so fair !
They're like the golden clouds that weave
Their tresses on the brow of eve.

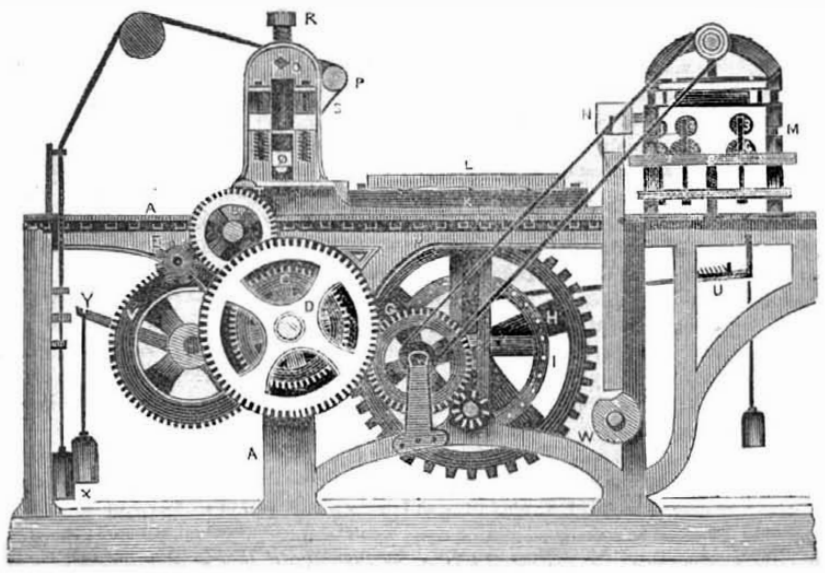
Golden, sunny, fair-haired Mary !
Where shall my pencil dip
In tints above, to paint the cherry
Vermillion of the lip ?
There are no hues, o'er clouds that play,
But fade beside those lips away.

Gleesome, winsome, gladsome Mary !
That merry heart of thine
Laughs through thy dimple cheek, my fairy,
In every tint and line.
No sullen cloud that floats on high
Is imaged in thy heart or eye.

Lovely cherub, dovelike Mary !
So frolicksome and gay ;
Far be the day, when angels carry
Thee to their home away !
Thy face so sweet, that radiant smile,
Bespeak thy spirit free from guile.

Dear, celestial, angel Mary !
Of love and beauty bright,
Heaven to thee hath not been chary,
Thou laughing little sprite !
For heaven's own smiles beam in thine own,
And all its hues are round thee thrown.

NEW LITHOGRAPHIC PRINTING PRESS.



This is a front elevation of a Lithographic Printing Press, invented by Mr William Smart of London, and which first appeared in Barlow & Payne's Patent Journal. The principle of it consists in the whole of the press work, with the exception of the operation of laying on and taking off the paper, being performed by a series of movements resulting from the first motion given to the machine, and not requiring the aid of hand labor to perform the work as heretofore. A portion of the standard framing is removed at one end. A A, are the standard and body frames of the machine. B E, is the driving shaft and pinion, receiving motion from steam or any motive agent, and communicating the same to the wheel C, which takes into and gears with D, thereby giving motion to the wheel G, which drives the pinion F. Keyed on the main shaft with the pinion F, is a large toothed wheel H, moving loosely on its centre or shaft, the periphery of which is perforated with the stud holes at the side, of sufficient size to enable studs, when brought in contact with them, to enter into and take hold of the wheel H ; for this purpose a ring or disc of metal keyed to the main shaft with the projecting studs is employed, so that by any lateral action, caused by a shifting clutch box on the main shaft, the wheel H, may be coupled with the fixed disc, by the studs entering into and uniting the two together, and revolve with the main shaft ; mounted, also, upon this shaft there is a concentric double action motion rack I, in which a pinion takes into, first on the outside thereof, thereby causing the toothed wheel H, to be thrown in play, during the printing process, in one direction ; and secondly, on the inside, by passing through an opening in the periphery of the rack, and reversing the wheel. J, is a horizontal rack, moving longitudinally, in the direction of a machine, in a suitable iron bed, in gear with the large toothed wheel H. K, is a wooden bed or sleeper fixed to the traversing frame on which a rectangular slab of slate is fitted to receive the stone L, at the top. M, are surplus head standards carrying the wetting and inking apparatus ; this part of the improvement consists in giving motion by means of the endless strap from the driving rigger on the main shaft to the doctor ink roller, which revolves at right angles with the supply and distributing rollers situated underneath, in the manner represented by the figures 1, 2, 3, 4, 5, 6, 7, 8, 9 ; for example, by the revolutions of the rollers 2, 3, moving on the face of the doctor, they receive ink therefrom, and convey it through the intervention of the other rollers aforesaid, to the stone, thereby completing the process of inking in the manner described. N, is the water trough and sponge box. It consists of a vessel of water having a series of tubes passing through the bottom of the box with their upper ends above the surface of the water, whilst their lower ones communicate with the sponge. A warp of cotton is placed in the upper ends of the tubes and allowed to descend into the trough below the water, which causes, by capillary attraction, the water contained in the trough to pass down through the tubes in connection with the sponge, and supply it with water without over charging it. This box is brought down on the surface of the stone when passing under for the purpose of wetting and remains until the subsequent process of inking is performed ; when upon the stone returning to the centre of the machine from which it started, to receive the paper, the action of a cam, so operating upon a vertical rod in connection with it, causes the box to be raised and the stone to pass out in readiness for the next operation. O, is a small framing mounted on the body standards A, for carrying the scraper and tympan roller P. Q, is the scraper, fixed, to a strong cross-head, which is regulated to any height by the screw R, in the centre. S, is the tympan cloth which is fixed at one end to a bar T, the other end is coiled round a roller P, on the shaft of which a pulley wheel is fixed, having a cord or rope bearing on it in such a manner that by the effect of this rope passing over another pulley, suspended at a distance apart, as shown, it shall cause, by the action of a weight at one end, the tympan cloth to be kept stretched, so that when the traversing frame, with the stone, is passing under the scraper, it may may catch hold of the bar T, and by the onward motion of the traversing frame, unwind the tympan cloth, and lay it over the stone until it shall have passed under the scraper and completed the printing operation. When, by the pressure being withdrawn from underneath the stone, the weight suspended from the end of the cord in connection with the pulley, P is then the medium through which the bed and stone is driven back into the centre of the machine ready for the next operation, by reason of the weight acting in such a manner, that when the tympan cloth has been unwound and placed on the surface of the stone, the mode of again winding it up is only effected by the proximity of the bar T, to the roller P, producing the diminution in the space from the contraction of the tympan cloth. To apply the power to the scraper and the traversing frame, a pressure roller is employed, actuated by a cam producing pressure at given times, such as when the stone is passing under the scraper ; but as soon as it has performed such operation the pressure will be withdrawn, and the means employed to assist its return rendered free to act. There is an arrangement consisting of a long bar or bearer U, with a counterbalance weight affixed ; this bar passes along the sides of the frame work and touches the boss of the cam wheel V, to which is attached a concentric arm, revolving with it ; the movement produced by such means on the long lever is for throwing a stop behind the traversing frame and checking its farther progress when not required ; at the same time giving to it an elasticity by the application of a spiral spring, so as to prevent concussion. On the means employed for throwing the driving wheel H, in and out of gear, depends the proper working of the machine. The means of employing studs as described consist in fixing two peripheries together by pressing the projecting pins on one periphery into the opposite holes in the other ; for this object a side-lever with a forked end is placed in connection with the clutch-box on the main shaft, which it shifts laterally within the limits of its fulcrum by the rotation of a cam placed on the sides of the toothed wheel V ; this lever so acted upon by the cam, requires a corresponding pressure to keep it up to its work. To do this the weight is applied and attached to it by a cord passing over the wheel Y, and attached to the lever, so that when the cam moves the end of the lever outwards, the weight X, will be raised, but when it falls, it will tend to move inward and throw out of gear the coupling disc aforesaid. When motion is given to the driving shaft B, by E, and communicated through the train of toothed gearing wheels, to the main shaft F ; such motion in consideration of the parts arranged for such purposes is caused to move the traversing frame by reason of the teeth of the wheel H, taking into the teeth of the horizontal rack and propelling it in either direction, by the reversing rack. The rollers may be made of india rubber and kept cool in a trough of cold water.

RAILROAD NEWS.

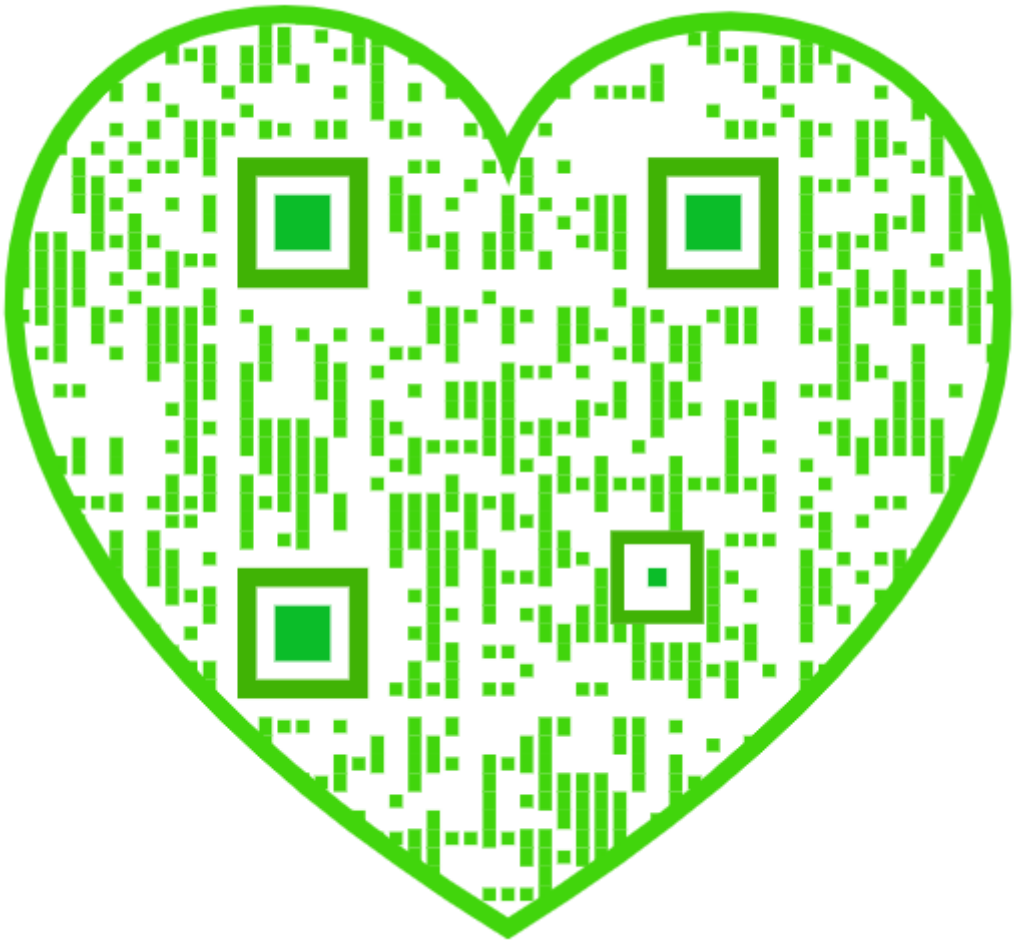
Illinois Railroad Convention.

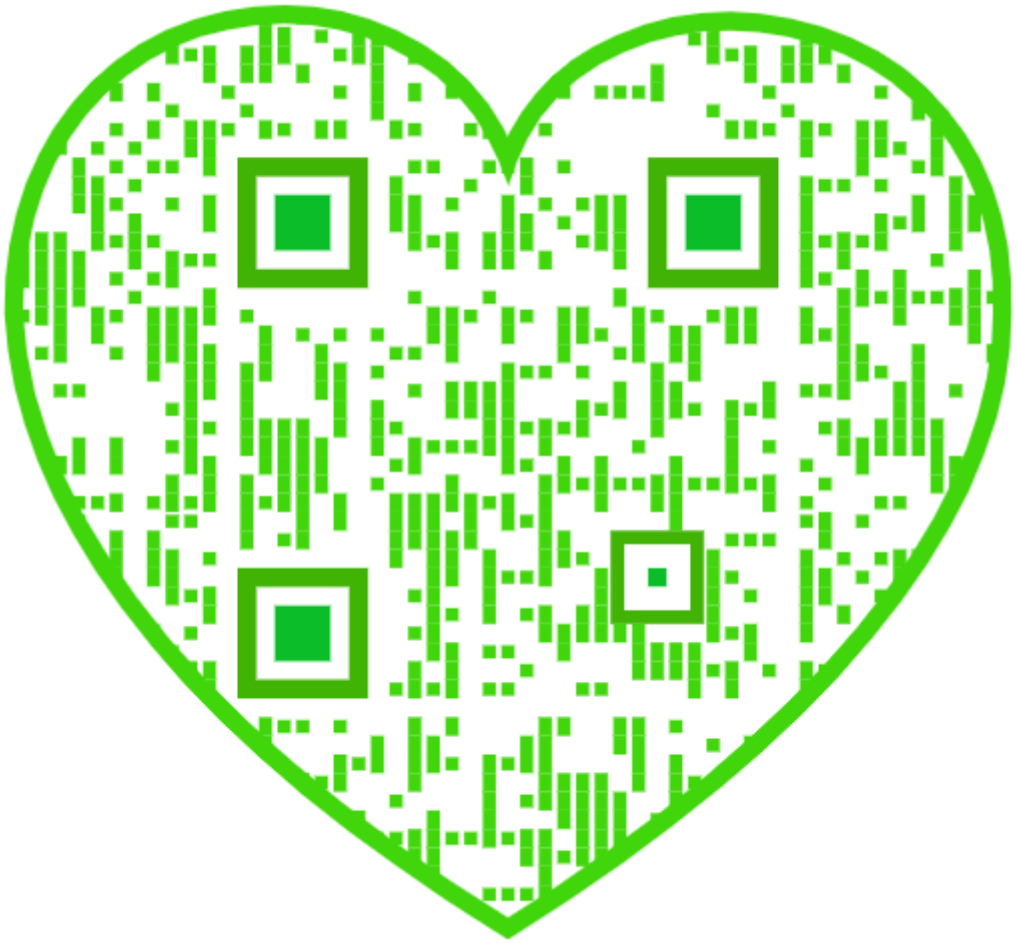
A Convention composed of 1015 delegates representing 22 counties of the State of Illinois, assembled at Salem, Marion county, Illinois on the 4th ult. Governor French, General Shields, and a number of distinguished public men, were present. Hon. Zadock Casey presided. The object was to oppose the action of the Illinois Legislature in refusing to grant the right of way through the state to the Mississippi and Ohio Railroad, which is a link in one of the chains between Philadelphia and St. Louis. A strongly written address to the people of the State, arguing the injustice, narrow-mindedness and absurdity of the Legislative action, was reported and adopted with immense appaluse. Pending its consideration, some gentleman moved to strike out all that part of the address relating to St. Louis. This is the sore point of the Illinois opposition ; but it was voted down. A series of resolutions was adopted, in which, among other things, the Governor was asked to convene a special session of the Legislature to consider the matter, and the legislative representatives from the counties composing the Convention, were instructed to use every effort to get the various railroad bills passed.

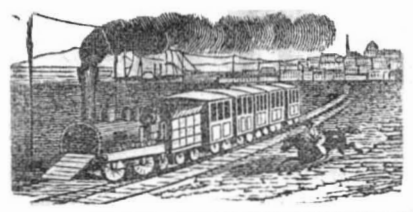
Galena and Chicago Railroad.

The Galena and Chicago Railroad will be commenced to Cottage Hill, 18 miles, by the 4th of July. The daily receipts now amount to between $50 and 60. This would amount to $15,000 per annum, supposing 300 working days in the year. It is expected the Road will be completed to Elgin some time this fall.

© 1849 SCIENTIFIC AMERICAN, INC







Cholera.

Wednesday,	June	27—43	new cases,	29	deaths.
Thursday,	"	28—60	"	29	"
Friday,	"	29—39	"	18	"
Saturday,	"	30—88	"	26	"
Sunday,	July	1—38	"	19	"
Monday,	"	2—108	"	39	"
Tuesday,	"	3—54	"	26	"

The above is our weekly list of cases. It will be seen that the daily number of cases reported is very changeable—so much so that our people doubt the accuracy of the reports. The cases of *private practice* reported, are the most erratic, and consequently suspicions of their incorrectness are well founded.

"Sun Stroke."

Some persons last week were victims to the heat, and all those employed in fields are liable to what is commonly called "stroke of the sun." A physician, Mr. Kilborne, in the Tribune recommends the following treatment for these attacks :

Sun-stroke consists essentially in a paralysis of the nerves that supply the heart. These nerves are principally from the eight pair or "*par vagum*," which arise from the *medulla oblongata*, at the base of the brain. Hence it is that in this affection we get symptoms similar to those that result from "concussion of the brain." The danger in this disease is just in porportion to the degrees of paralysis.

As the disease consists in a want of action of the heart, common sense, without any physiological knowledge, would suggest the appropriate mode of treatment, viz. stimulants and counter irritation. Place the patient on his back, in a horizontal position—give him fresh air ; keep him well covered and warm ; apply cold water to his head—hot bricks, sand, &c., to his feet and round him—frictions, mustard to the pit of the stomach and extremities. Internally give stimulants—as brandy, ether, ammonia, capsicum, &c.

[In the South it is a common practice in some places to bleed in the soles of the feet for this evil.

Improvement of Western Rivers.

It is said that Mr. Ellet, is now making a series of observations on the velocity, amount of discharge, and the height of the Ohio river in its various stages. These observations are to be continued several years. They are designed to demonstrate the practicability of maintaining a uniform depth of seven feet water for steamboats, by constructing great reservoirs at the sources of the stream—collecting the annual flood there, and regulating the supply of water to the river by means of locks and dams.

Lead Pipe for Water.

We have received the Report of E. N. Horsford, Rumford Professor in the University of Cambridge, it being an investigation made at the suggestion of the Board of Consulting Physicians in reference to supplying the inhabitants of Boston with water from Cochituate by branch pipes of lead. It comes from the American Academy of Arts and Sciences, at the University. We should like to present a condensed review of it, but we cannot do this at present. We consider it to be the best standard report on the subject and we wil often have to refer to it, for information.

Ten Hour System at Washington.

Mr. Meredith and Mr. Collamer have issued orders, requiring the employees in their respective departments to make their appearance earlier by an hour than heretofore. The order is called the ten hour rule, because it also authorized the chief clerks of subdivisions to require their subordinates to work ten hours a day, when the state of the business renders that degree of application necessary, the practice heretofore has been to begin work at nine A. M. and cease at three P. M.

Superior Dental Operation.

A few days since we were called upon by Mr Horace Bancroft, of St Charles, Kane Co., Ill., with whom we were somewhat acquainted, who desired us to inspect a set of artificial teeth which had recently been inserted by Dr. Dudley, of this city. He informed us that 15 years ago he was thrown from a wagon and had most of his teeth knocked out, together with a large piece of the superior maxillary and a part of the incisive fossa. He applied to the most skillful dentist in Illinois, but was informed that nothing could be done for him without first taking out three remaining sound teeth, and removing all the old stumps. To such an operation he was unable to submit, and he gave up all hopes of relief. At length he chanced to see a notice of Dr. Dudley's improvement in preparing old stumps for the reception of pivot and plate work in the Scientific American, and came on to Boston immediately, to have him try his skill in his case.

The result of Dr. Dudley's labors has proved how much can be done towards restoring lost functions, and how completely a skillful dentist can imitate nature. Mr. Bancroft told us that the teeth were perfectly easy in his mouth, that they set firmly upon the jaw, and that, for the first time during 15 yaars, he could eat as well as when he possessed the teeth that nature gave him.

We deem this case one worthy of particular notice. The dentist in this case not only had the loss of the teeth to make good, but he also had to make amends for the absence of a large portion of the jaw-bone, and has done it effectually. We do not hesitate to recommend Dr. Dudley as standing at the head of his profession, and, from actual experience, we can assure our friends that a better or a more faithful dentist cannot be found. His establishment is at No. 238 Washington Street, Boston, where specimens of his improved work may be seen.

[The above is from the New England Washingtonian, Excelsior and Rechabite Journal), a paper of sterling worth and which is edited with uncommon ability. The case referred to above was unknown to us before. It is one of the many instances of good done to individuals, by bringing to their view, new and useful discoveries.

A Grave Joke.

A Cincinnati paper relates the case of a man who rose from his coffin while the burial service was performing. It adds : "The consternation of the assembled company may be imagined, but it cannot be described. Some were for leaving immediately, some were incredulous, and some believed a miracle had been performed. The scene took place on Walnut-st above Canal and may be ascertained by any one disputing our report. At last accounts the person was doing well. We understand the cause of the man's stupor was a large a quantity of cholera medicine given him, containing opium."

Manufacture in Georgia.

That Georgia is destined to take the lead in the South, in the business of manufacturing, seems evident. She has obtained a position in advance, which as regards this branch of industry leads to progressive improvement and certain success. In almost every part of her territory an industrial movement in this direction is visible. Columbus, Georgia, has some twelve manufacturing establishments, with a capital of about $400,000, and a flour mill is about going up with a capital of $100,000. There are several cotton mills, an iron foundry, a cotton gin factory, manufacturing about 18 gins a week, a wool company, &c.

Collins' Steam Ships.

The Steamship Atlantic to run between this city and Liverpool is nearly finished.—The sooner this line of E. K. Collins is completed, so much the better. The national benefits of our late postal arrangements with Great Britain are all one side. This is owing to our want of steamships to compete with the Cunard Line. Hurry up your steamships Mr. Collins, you must have your deserved shar of the benefits under the stars and stripes.—There is no use of letting the Union Jack sweep in to the Jersey City Line, all our money for letters—as it does at present.

To Obtain Salts of Potass for Felspar.

To obtain the sulphate of potass from felspar mix two parts of the felspar ground into powder, with one part of lime and one part of the plaster of Paris

These ingredients are evenly spread over the hearth of a reverberating furnace heated by charcoal or coke, and the heat raised as high as possible but not to fuse the mass.—These ingredients must be carefully stirred continually to mix the whole thoroughly and equally. The furnace must be built with a series or earthen pipes to allow a great quantity of oxygen to the ingredients on the hearth of the furnace. When the decomposition is perfect, which will be at the end of about eighteen or twenty hours, the ingredients are withdrawn, and, when cool, washed repeatedly with hot water, as the alkali adheres obstinately to the lime; the alkali is obtained from the solution by evaporation and crystalization in the usual manner. To obtain muriate of potass, mix equal parts of potass-felspar and common salt, and then apply heat to the mixture in an iron retort fixed horizontally in a furnace—the retort having an opening at one end for the purpose of charging it; but at the top, a small hole stopped with a loose plug, which serves to prevent the bursting of the retort should any gases be generated during the decomposition. When the retort is charged with the above mixture, and the door luted in its place, the heat is raised till the salt fuses, and maintained at that temperature for about eight hours; the charge is then drawn into an iron pot and covered over till cold, and then by means of water, or evaporation and crystalization, the muriate of potass is separated from the other ingredients. To obtain the chromate of potass, place evenly on the hearth of the reverberatory furnace a mixture of four parts potass-felspar, four parts of lime, or the equivalent of carbonate of lime, and one part of chrome-ore, all in powder and intimately mixed. The heat is to be as high as possible below the fusing-point of any of the ingredients, and the greatest care must be taken to prevent even incipient fusion, which would spoil the operation. During this operation the air in the furnace must be carefully maintained in an oxidizing state, by admitting air through the tubes mentioned in describing the process for making sulphate of potass. The progress of the operation may be ascertained by taking out portions now and then, and examining them; when the decomposition is finished, the charge is withdrawn, and when cool the whole is thrown into hot water, and the chromate of potass dissolved out and then recovered by evaporation in the manner described.

Cholera at Saratoga.

A correspondent of the Tribune, writing from Saratoga Springs, June 27th, gives a list of deaths at that place in the previous fifteen days, and the diseases causing them; from which we learn that the deaths numbered 15 ; of undoubted cholera 7 ; doubtful 3 ; other diseases 5.

Before the cholera broke out in the United States, Dr. Jackson of Boston, said that it was a Geological disease, and would not affect the Granite districts of our country. We are paying particular attention to his prediction. We are inclined to believe its general correctness.

Sea Serpent Book.

Mr. John Bartlett of Cambridge Mass., has in the course of publication a book on the Sea Serpent. This work will contain a story of the monster and all about his swallowing a man, and also about his visit to Nahant, Gloucester and other places, together with all that is known on the subject of sea serpent by all the Savans in the world. The work will be illustrated with cuts, in which his head will be visible a long ways above the water. The price is only 37½ cents.

[This will be a great book. We suppose that it will also contain some account of the Kraken, that wonderful fish that cant live on the land and is never seen but out of the water.

Mrs. Judson, formerly known as Fanny Forrester, who left this country a few years since for the Burmah mission, with her husband, was dangerously ill on the 23d of March last.

Silex.

The beautiful glossy coating is flint. The rattan of the East Indies is admirably coated with it Examine with a microscope the surface of wheat straw, or of rattan, and you see this glossy coat broken in circular stripes around the stem, showing that it is caused by the necessary bendings of the stems under the pressure of winds and other forces. This apparently refractory substance is proved to be soluble in water, and used by the plant in forming this beautiful coat impervious to water. By experiment silex (silicia) has been dissolved by hot steam carried up as a vapor, and then falling condensed like a hoar frost.—It has long been supposed that plants have power to gain a coat of glass and their flowers to use the metals for their colors. The flowers of violets have been made to exhibit the fact that gold was in the violet color.

[The above is a beautiful extract from the Farmer & Mechanic, in its report of the proceedings of the Farmer's Club. The part which silex plays in the vegetable world is very important. The only place where silex has been found combined with water, is in the Geyser hot springs of Iceland. With regard to gold forming a component part of the violet, we do not believe a word of it. Violets grow in regions where not a particle of gold has been or can be detected in the earth. The violet color of the violet, can be formed by the hæmetoxylin of the flower which is a vegetable extract of a beautiful wine color Of this substance and its uses, the Farmers Club may not be well acquainted.

Book Binding.

Some idea may be formed of the extent of the London book binding trade in the nineteenth century, when we state that the weekly consumption of leaf gold enriching the exterior of books, amounts to about 3,600,000 square inches ; and the weight of paper shavings sold annually by the London binders, cut off the edges of books, amounts to 350 tons !

Restraint on Marriage.

The Supreme Court of Pa., has decided that a testator can devise real estate to his widow upon condition that she shall not marry again In the Common Pleas of Lancaster county, such condition was held to be void, upon the principle that contracts in restraint of marriage are not favored by the law. But the Supreme Court has settled the question another way. Chief Justice Gibson delivered the opinion.

The Cotton Crop in Mississippi.

We regret to learn says the Yazoo Democrat of the 13th, that the lice and worms are depredating to a very destructive extent in the Cotton fields of this and the adjoining counties. The damage thus committed, coupled with the effects of the frost, forbid the hope that a full crop will be gathered by the planting community in this proportion of the State.

Heat at St. Louis.

The Republican says : The heat has been insupportable in exposed situations, and double and treble wages were offered for laborers but without obtaining their services—20 to 25 cents per hour was offered to laborers, and 40 to 50 cents per load to drays. A few consented to work at these rates, but the majority refused to do it, and retired to the shade.

Bad News for Rogues.

It is said that the Post Office Department intends to institute a more thorough and energetic system for the detection of dishonesty and irregularities occuring in that important branch of the public service, than has ever been heretofore enforced. Some of the means adopted by the agents are so ingenious, that mail depredators may hereafter calculate upon a birth in the State prison, with a considerable degree of certainty.

Ancient grave-stones have been discovered on Boston Common, dearing date 1672, 1685, 1702, &c. They were Burrill, Tyng and Porter. They were found by some workmen while digging a trench.

The dread of cholera has completely cured people of lobster eating. Two thousand were thrown overboard the other day at Gloucester, Mass.

© 1849 SCIENTIFIC AMERICAN, INC

Motion.

BY B. F. STICKNEY.

No. 4.

We have endeavored to show in former numbers, that there is a universal fluid, first among created things—placed by the Author as a main-spring and regulator, to the whole. We have learned to apply it to our uses in a few cases. The navigator and land surveyor use it to guide them on their course; and Morse and others use it to converse at a distance, calling it magnetism. We make use of common light and heat in various ways, calling it solar light, and solar heat. We have got the art of bringing this fluid into action in the form of combustion; and apply it to our ordinary domestic uses. And under the names of Electricity and Galvanism, the general philosopher and physician make use of it; and some venture to call it nervous fluid. The old philosophers made a machine, that by giving a circular motion to a glass cylinder, they produce a friction by which they put this fluid in motion, upon a very small scale. But it served to show a very important principle of its action—it showed that by friction this fluid could be put in motion, and conducted into glass jars; that by such means miniature thunder and lightning can be produced. Physicians in their practice, make use of friction in a very moderate degree, and some report favorable; but not tracing back from effect to cause, and not understanding the cause, or mode of operation, they rarely if ever, do it in a proper manner, or to a sufficient extent. Although physicians will tell you, that if a young person sleeps in the same bed with a very old one, that the young one is injured in health and strength, to the benefit of the old one; without making much inquiry into the cause. They do not appear to to be aware that the nervous or universal, and invisible fluid, is passing continually from one person to the other. Now, suppose we apply this principle. Suppose a very common case—we will suppose a very highly inflamatory case. The physician uses depletion and sedatives to allay the fever. Of a sudden the inflamatory is changed to a typhoid case—a congestion has taken place. Now what should be done? I answer, that I would apply the principle above mentioned, that the fluid is always passing from the stronger, to supply the weaker, or always pasing from a body positively charged, to one negatively charged, when in contact, or nearly so. If I had it in my power, I would select the strongest men, or in other words, those having the most positive charge of the fluid, and as many as could act upon the patient, with most violent friction, And I would use a stimulating liquid, to the surface so far as to avoid abrasion to the skin (common pepper-sauce and brandy) and I would use very freely tonics and stimulants, by the mouth. I have applied this mode of practice, from thirty to forty years since, with unvarying success. There are witnesses living in this neighborhood, who have seen the success of my practice in this manner.

The foundation of our theory, in this respect, is, that all inflamation or fever, arises from such a derangement of the animal economy, as to prevent a proper motion or circulation of this vital fluid. And a cause behind this, may be, an unfavorable proportion of the elements composing the atmosphere; the most unfavorable of which, probably is, the carbonic acid gas; there being a great affinity between this gas and hydrogen gas; and the former being the heaviest of the gases, and the latter the lightest. Both of the gases, being present, the hydrogen gas will take on a considerable load of the carbon, and yet maintain a sufficient levity, to be raised an hundred or more feet. We conceive that when carbon considerably prevails, Cholera asphyxia, will be the consequence, and when hydrogen prevails, it is what is commonly called malaria; and produces the ordinary inflamatory diseases.

[This concludes the articles of B. F. Stickney Esq. of Toledo, Ohio, on the nature, causes and effects of motion. The articles have no doubt been very interesting to many of our readers, as they are very practical and display a great amount of keen observation and personal experience.

Water Wheels.

MATTEAWAN, June 28, 1849.

MR. EDITOR.—The present calculations are on the large overshot water wheel now building at Paterson, N. J. The object is to show the power that would be lost if the site was divided into two falls, that is, having two wheels, each about half the diameter of the present one.

The wheel being 66 feet in diameter, the whole fall must be 69 feet. The circumference of the wheel is calculated to run 6½ feet per second. The buckets are 6 feet long, and 13 inches deep. The wheel will produce its maximum effect where the water is 5 inches deep in the buckets (on the top of the wheel.)

In this case the power of the wheel will be 124 14-100 horse, which appears from the following formula.

$$H = \frac{v \times a \times F \times w}{c}$$

The letters represent the initials of the several elements involved in the formula (v) equals the velocity of the water at the centre or magnitude. The theoretical power due to the quantity of water which the wheel will receive per minute is 124 14-100 horse and the per cent of which this wheel is capable of transmitting will appear in the following calculation.

The whole fall is 69 feet or 828 inches.

Allow 10 inches for clearance below the wheel, then 10 inches of the whole fall will be lost or $\frac{10}{828}$ of the whole fall, or : .012

Allow two feet for the head which acts on the wheel by percussion, hence 2-3 of the effect is lost, or 16 inches lost, or $\frac{16}{828}$: : : : : .019

The water will begin to empty from the buckets at about 6 feet from the bottom of the wheel, which gives a medium loss of nearly 36 inches or $\frac{36}{328}$ or : .043

The depth of the water in the buckets on the top of the wheel will be 5 inches, the buckets are 13 inches deep; then 5 from 13 leaves 8, half of 5 is 2½, which gives 10½ inches lost or $\frac{10\frac{1}{2}}{828}$ or .012

The velocity of the wheel is 6½ feet per second (or water) nearly, the theoretical velocity due to 69 feet head is 66 feet per second nearly, hence $\frac{6\frac{1}{2}}{66}$ loss by velocity of wheel, or : : .110

Showing a loss of nearly 20 per cent, .196

Now if the site should be divided in two falls each 34½ feet they would require wheels 31½ feet in diameter It can be shown by a calculation slmilar to the foregoing, that each of these wheels would suffer a loss of 30 per cent—all the elements being the same in both cases, hence the large wheel gains 20 per cent over the two.

It was shown that the theoretical power was 124 14-100 horse; deducting 20 per cent gives 99 horse power nearly, which the large wheel transmits. The theoretical power of each of the small wheels is 62 horse, nearly, —deducting 30 per cent gives 43½ horse power nearly, or both wheels transmit 87 horse power, showing a difference of 12 horse in favor of the large wheel. It can be shown by a calculation that if the buckets were 14 feet long and the wheel ran 3 feet per second, it would transmit 92 per cent of the whole power, All the various kinds of turbine wheels, are subject to the same kind of investigation, many of which involve numerous radical errors.

C. E. L.

Nitrogen and Some of its Applications.

The nitrous oxide, or laughing gas, is best obtained by the decomposition of nitrate of ammonia by a spirit lamp. The nitrate is put into a retort or flask; the heat is then applied so as to raise its temperature to about 400° Fah., but never above 420° for above this heat nitric oxide would be evolved. The gas if it be intended for inhalation, ought to be quite pure; but as the nitrate of ammonia is sometimes adulterated with hydrochlorate of ammonia, the gas obtained from such adulterated nitrate would contain chlorine. It is, therefore, absolutely necessary to purify the gas before it is inhaled, by passing it, first through a bottle containing a weak solution of nitrate of silver, which will absorb the chlorine, then, collecting the gas over water containing protosulphate of iron in solution which will absorb any nitric oxide that may have been formed by the application of too great a heat. The decomposition that takes place, during the above process is a beautiful illustration of the power which heat possesses (in some cases) of resolving certain compounds.

Nitric Oxide is a gas which is evolved when certain metals—copper for instance—are being subjected to the action of nitric acid. This gas is colourless and not acid; but on coming in contact with the atmosphere, it unites with one or two more atoms of oxygen and forms hyponitrous or nitrouse acid in proportion to the facility with which it meets with oxygen. Both the above compounds are extremely injurious when taken into the lungs: thus, it is necessary that in all cases where any considerable quantity of nitric acid is being employed for dissolving metals, &c., the gases evolved should not be allowed to escape into the laboratory or workshop. Nitric acid is a most important compound on account of the facility with which it imparts oxygen. It acts on most animal and vegetable substances, and mutual decompositions ensue; oxalic malic, and carbonic acids are the most common products of these decompositions; and the nitric acid is at the same time reduced to the state of nitric oxide, by the abstraction of its oxygen. Fatty matter, ammonia, and hydrocianic acid are also sometimes formed.—From the remarkable property of tinging animal matter yellow, nitric acid is employed in the production of yellow patterns upon coloured woolen goods. It is used in fumigations to destroy contagious and infectious matter, in those cases where chlorine would injure if used for the same purpose. When employed for this object, nitrate of potass and sulpuric acid are mixed in a saucer; and sulphuric acid decomposes the nitrate of potass, and nitric acid is evolved: this decomposition may be aided by the application of a gentle heat. It is not, however, generally so effective as chlorine. In pharmacy, and a variety of other processes, it is susceptible of many interesting applications. It is used for etching on copper and steel: in this process, the steel or copper plate previously burnished, is covered with a varnish compound of virgin wax, 4 parts—asphaltum, in powder, 4 parts—black pitch, 1 part—Burgundy pitch, 1 part. The wax and pitch are first melted, and the powder asphaltum added by degrees; the whole is to be boiled gently till all the ingredients are thoroughly incorporated. When sufficiently boiled, the varnish must be allowed to cool until it has almost acquired solidity, then poured into warm water, when it may be moulded with the hands into any required shape. The varnish is thus applied;—the plate is heated over charcoal, a stick of the varnish is then applied until a sufficient quantity has been melted on the plate, then by inclining the plate in different directions, the varnish may be made to flow evenly over the surface; should too much heat, however, have been employed, the varnish will become filled with air bubbles—In this case, the varnish must be dissolved and another coat applied until it assumes, when cold, a bright and smooth surface. The thick lines of the intended picture are traced through this varnish, the plate is dipped for a few seconds in dilute nitric acid, which eats into the plate only where the varnish has been scratched off, then washed in water; and the next in order of the thick lines are etched out through the wax—the dipping in the acid, and the washing are again repeated, and thus the work proceeds until the finest lines are arrived at. Thus those lines which were first traced out, having been so many more times subjected to the action of the nitric acid, will be as many times deeper etched into the plate than the fine lines; and thus the proper effect is ultimately imparted to the picture or engraving. Nitric acid is the solvent most frequently used for dissolving metallic compounds in the process of analysis. In medicine it is prescribed in doses of a few drops in a glass of water as a tonic; and in surgery as an energetic caustic. In the event of a bite from a rabid animal, if immediately applied to the wound, there is every reason to believe that it will destroy the poison, and prevent those fatal consequences otherwise likely to ensue.

Animal Heat.

"Billing in his first Principles of Medicine' says that heat is extricated all over the frame—in the capillaries by the action of the nerves during the change of the blood, from scarlet to purple venous, and also while it is changing in the lungs from purple to scarlet.

There is a perpetual deposition by the capillary system, of new matter, and decomposition of the old, all over the frame, influenced by the nerves. In other words, the galvanoid or electroid influence of the nerves, which occasions these depositions and decompositions, keeps up a slow combustion. In this decomposition, there is a continual disengagement of carbon, which mixes with the blood, returning to the heart at the time it changes from scarlet to purple. This decomposition, being effected by agency of the nerves, produces constant extrication of caloric. Again, in the lungs, that carbon is thrown off and united with oxygen, during which operation the caloric is again set free; so that we have, in the lungs, a charcoal fire constantly burning, and, in the other parts, a wood fire,—the one producing carbonic acid gas, the other carbon the food supplying through the circulation, the vegetable or animal fuel from which the charcoal is prepared that is burned in the lungs. It is thus that the animal heat is kept up; while on the other hand, the evaporation of perspiration keeps the surface cool; but, in high fevers, where this is deficient, the body gets too hot, and in low grades of fevers, when the nervous influence is not sufficient to keep up the full fire, the surface gets cooler than the natural standard.

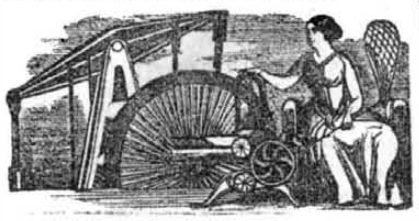
This is peculiarly evident in the beginning of eruptive fevers, as scarlatina, where there is a strong heat with the arterial color of the skin; but, if the same becomes malignant and low, with deficient arterialization, the the temperature sinks, and the diminution of the charcoal combustion in the lungs is evinced by the dusky color of the skin, showing that the carbon is not thrown off as it ought to be; and the same phenomena take place in typhoid fever.

Economy of Chemical Discovery.

For a considerable period, chlorine vapor was one of the greatest nuisances to the manufacturer and to the neighborhood, blighting vegetation for a great distance around the work. Enormous sums were spent in erecting gigantic chimney stacks, such as those of the Messrs. Tennant, near Glasgow, Scotland, where one of the largest rears its head fully one hundred feet higher than the top of St. Paul's Cathedral. Its occupation has gone, with the advance of chemical knowledge; and it now remains a huge monument to the ignorance of the past. In other cases the muriatic acid was let off into the common sewer, and glad where the manufactures to get rid of their acid and troublesome product in this quiet way. But now that muriatic acid has entered from its proper chemical relation with the arts, it is as carefully preserved and retained as it was formerly dismissed.—Various plans exist by means of which it is collected and reduced from the gaseous to the liquid form. The most common of these is, to conduct the vapours which rise from the decomposing salt into flues, which terminate at the bottom of a tower or chimney filled with flints or coke. A number of minute jets of water play on the coke at the top of the chimney, and the fluid gradually filters down meeting in its course the ascending noxious vapors. These become immediately condensed, and the liquid percolating to the bottom, there enters a tunnel and is conducted into a receptacle, now in the form of liquid hydrochloric or muriatic acid.

Here we have a case by which the People of Pittsburgh and those of other places where they burn bituminous coal, may profit. The smoke nuisance may get thus converted into a profitable manufacture.

© 1849 SCIENTIFIC AMERICAN, INC



New Inventions.

New Machine for Carving.

Mr. W. B. Gleason of Boston, Mass. has invented a machine for carving ornamental work such as the legs of piano fortes, tables &c. It can also carve statues and cornice work, in fact it can carve any kind of ornamental work, and any figure. A pattern is used from which to carve duplicates, one, two, or more; or it can produce the reverse surface of the pattern, such as an elevated part for the depresson on the pattern, or vice versa,—a fac simile of the pattern. The pattern does not revolve, but is moved by an intermittant rotary motion, while a tracer upon a sliding frame like that of a lathe, traces a horizontal section of the pattern and guides the carving tools, one or more, to carve a fac simile on the rough blocks of a horizontal section of the pattern. One pattern will answer to carve a number of blocks at once. The inventor has taken measuaes to secure a patent, and we hope to present an engraving of the machine to our readers at some future period

New Discovery for Soldering Iron or Steel.

Mr. W. H. Clement of Warsaw, Alabama, has discovered a new composition whereby he can solder pieces of iron or steel, either in plates, or in other forms. The plates of iron are soldered together as plates of tin by the common process. We have seen some rusty strips of steel beautifully soldered by this composition, without the necessity of scouring the edges, and it was done as easily and quick as a tinker would patch up a seam in a milk pan. Mr. Clement has taken the usual measures to secure a patent.

Manufacture of Iron.

Gideon G. Dennis, Esq. of the Mount Hope Mills, Portsmouth, R. I. has made several very valuable improvements in the manufacture of iron, one of which he has disposed of for $30,000.

Explosion Preventer.

Mr. Daniel Burns, of Detroit, Mich., has invented an apparatus for the prevention of the explosion of steam boilers, and also to prevent the breaking down of engines. It is upon the electric principle, and the inventor feels confident that danger from explosion may be entirely obviated by the use of his improvement. The principle of this invention has not been made known to the public, as the inventor is about to apply for letters patent.

To Prepare Cotton Cloth to write on as a Substitute for Paper.

The cloth must be singed, the same as for calico printing to remove the loose fibre, and it must be bleached, after this it must be run through a solution of one pound of resin dissolved in one gallon of a solution of potash, or soda, in which is dissolved about 4 ounces of the alkali, or as a substitue for this but more expensive, the cloth may be run through a solution of resin dissolved in alcohol and then diluted with water. After this the cloth is run through a solution of one pound of alum dissolved in one gallon of water, and well squeezed out of this, when it is then passed through a solution of starch or gum to give it stiffness and fill up the interstices of the fabric. The cloth is then dried by being pressed first through pressing rollers and dried in a stove room, or, over hot copper cylinders heated by steam. The cloth is then pressed between sheets of pasteboard with the hot press to glaze it in sheets, or it may be glazed by the friction rollers in the same way as cloth is calendered. Paper manufacturers understand how to glaze it. There is considerable of this cloth imported for drawings, it being more durable than paper, and it can be wrote upon in the same way as paper.

New Pigments.

The following new paints are described in the Philadelphia Ledger, as discoveries made by H. M. A. Mahn, last year.

COLUMBIAN VERDIGRIS.

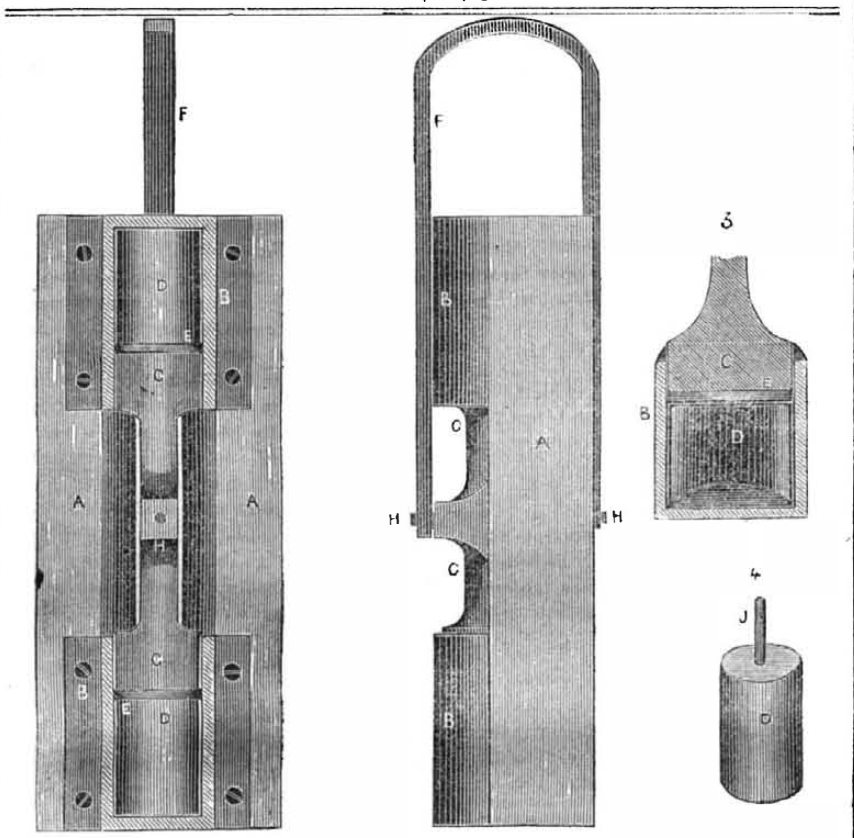
Sulphate of copper, 2 parts; alum 1 part; brown sugar 8 parts, and yellow soap 8 parts; Make a hot solution of the blue vitriol in a proper quantity of water, then add the alum, then put in the sugar, which will almost instantly convert the blue into green; the solution of soap must now be added, which must have been previously made; both solutions being boiling hot at the moment of their junction. The article supercedes the old verdigris, both in durability and color, and will stand all kinds of weather.

MAHN'S GREEN.

This pigment was discovered May 29, 1848. Its preparation is as follows :—1 pound sulphate of copper, 2 ounces alum, and 1 pound good light yellow soap; make a solution of the vitriol in a sufficient quantity of hot water, then add the alum, then pour in the soap, having also been prepared in boiling water to the consistency of cream—a beautiful green immediately floats on the surface.

Several other kinds can be made, by varying the proportions or adopting the different methods. This paint can be used immediately on being made, by being dissolved in a little warm oil or spirits of turpentine and mixed with some white lead or chrome yellow, &c. so as to make it corporeal and heavy.

For Japan ware it is excellent, without any admixture; for making marine paint it is very good; for coloring wax, it is better than most other greens, and in point of cheapness and facility of its production it excels all other pigments



This is the invention of Mr. William Beers, of New Haven, Connecticut, and which was noticed in No. 40 this vol. Scientific American. The nature of it consists in providing an elastic diaphragm, or vulcanized india rubber bag, to contain the air in the cylinder of the air spring, so that there can be no fears of the air escaping from leakage. The accompanying engravings represent four views placed vertically. Fig. 1 is a vertical section. Fig. 2 a side view. Fig. 3 a vertical section of cylinder, air bag, and piston; and fig. 4 a view of the air bag or elastic diaphragm. The same letters on all, refer to like parts. A, is that part of the truck to which the spring is secured. B B, represents the cylinders. They are cast with side flanges by which they are screwed down to the truck, as represented in fig. 1. C C, are the pistons fitted into the cylinders B B. If the pistons were fitted and packed air tight in the cylinders and the cylinders filled with compressed air, a most powerful air spring would thus be formed. This has been done heretofore, but the least leak between the piston and the sides of the air cylinder at once destroys its utility. This invention removes that evil in a very simple manner. D, is a bag of vulcanized india rubber, in which the compressed air is confined, it being filled by the small tube J, of the same material, which can be tied up perfectly tight. E, is a leather washer placed over the bag D, below the piston C. F, is a buffer rod or link, and is only placed here to show how the two pistons air cylinders or springs can be connected to operate simultaneously by one connecting rod at H H; but the principle is as applicable to a spring composed of one piston and cylinder as it is to two. These engravings and this description will convey to any person a clear understanding of the invention. It is founded on the compressibility and elasticity of the atmosphere. It has been held to be superior to any artificial substance for graduating the strain upon important parts of carriages, and thus affording an excellent medium to prevent much breakage from sudden concussions, &c. as the air can be compressed into a very small space by pressure, but after the pressure is removed, it immediately expands to its natural bulk, occupying the same space as before. No wear can destroy its elasticity and no power but a chemical one change its nature. We mentioned before that Mr. Beers han taken measures to secure a patent.

New Uses of Granite.

Those who have taunted New-England with producing nothing but granite, may change their tune. A Mr. McDonald, in Scotland has discovered a method of calcining granite to a fine clay of extraordinary strength for pettery especially for making water-pipes, some of which are as large as 18 inches bore. And a discovery has been made in Ireland that the granite on an extent of 70 miles in Wexford, Ireland, contains so large a proportion of potash that the alkali can be extracted by a chemical process, so as to become an article of commerce. It is estimated that there are 2,000 tons of potash, the produce of America, consumed annually in England and Scotland, the present cost of which is £40 per ton; and that by working the granite of Dalkey, which extends inland to Sandyford, the same quantity would be extracted by means of the capital of $10,000 and sold at £20 per ton, yielding a revenue of £40,000, remunerate the capitalists and diffuse the blessing of employment among the people, and not only render it quite impossible for the Americans to compete with the Irish, but really push an Irish trade in potash into the American Continent.

The above is from the Dublin Evening Post an Irish paper. Ireland has great natural capabilities but there is very little enterprise for manufactures or commerce among her wealthy men. We therefore have no hopes of her granite potash being able to compete with the American in her own market.

Powder to make Iron Malleable, and to Clean it.

Take 1 3-4 lb. of the peroxide of magnese, 3 3-4 lbs. of common salt, and 10 ozs. of potter's clay—the clay and the common salt are the most important elements. By the heat of the puddle oven, the salt mixed with the clay is decomposed. The natrium, either on account of the air, or the peroxide of maganese, attaches itself to the oxygen, and changes to natron, which, with the argillaneous and quartzose earth, forms itself into a silicate, or aluminate, of natron, and goes in the slag. The peroxide of manganese loses a great quantity of its oxygen, and forms itself as oxide of manganese with the silicious earth (from the silicum of the pig iron) to a silicate, and prevents the loss of the metal. This free chlorine, which, with constant stirring is brought to bear on the mass, attaches itself to ths sulphur, phosphorus, or arsenic, and makes combinations, which are carried out of the furnace through the grate. From this it will be seen, that this method not only cleans the iron, but shortens considerably the process of rendering it malleable. The quantity of peroxide of manganese can be considerably diminished, when it is worked in open hearths, as in some places in Germany. It was endeavored to introduce this method of iron smelting by cupola furnaces, but, on account of various reasons, it could not be carried into execution. It was proposed to employ sal-ammoniac instead of salt; the chlorine in sal-ammoniac is double the quantity of that contained in an equal weight of salt. No clay is required, it does not increase the slags, and the quantity of hydrogen gas in sal-ammoniac (7 or 8 per cent.) contributes much to the cleansing of the iron. The expensive cost of sal-ammoniac has prevented its employment on a large scale.

Railroad Speed and Power.

By a pamphlet lately published in England, we learn that "to master an ascending gradient of one foot in 300 feet distance, a trifling rise, a traction force is required twice as great as is sufficient to move the same speed along a level railroad; also the greater speed required on any line, the greater must be the power employed. A good locomotive, of the heaviest kind now used, will draw a train of fifty loaded wagons, or a gross weight of 375 tons, at a speed of from 15 to 20 miles an hour, but the same engine will only be able to draw, on the same line, a train of twenty-five wagons —being half of the above weight—at a speed of 30 miles an hour. Thus the 30 miles speed cost double the slower speed of 15 or 20 miles besides the great additional wear and tear.—the demand for power increases in rapid proportion to the rate of speed. Going at the rate of 10 miles an hour, a locomotive will draw 250 tons; but push the speed to 30 miles an hour, and it will draw only 28 tons On the Continent, railway trains run at a low rate of speed, say 15 to 20 miles an hour, and thus enable companies to charge light fares, while they ensure the safety of the passengers."

A Cuba Rocking Chair.

Mr. Bryant in his letters from Havana, says that the Creole ladies love to recline on sofas; "their houses are filled with rocking chairs imported from the United States, they are fond of sitting in chairs tilted against the wall, as we do sometimes at home. Indeed they go beyond us in this respect; for in Cuba they have invented a kind of chair which by lowering the back and raising the knees, places the sitter in precisely the same position he would take if he sat in a chair leaning backwards against the wall. It is a luxurious attitude I must own, and I do not wonder that it is a favorite with lazy people, for it relieves one of all trouble of keeping the body upright."

Steam Hod Carrier.

At the mill yard of the Lowell Manufacturing Co., Mass., the bricks and mortar of the New Woolen Mill are all raised by the power of a steam engine. The engine is about 6 horse power.

© 1849 SCIENTIFIC AMERICAN, INC

NEW YORK, JULY 7, 1849.

Declaration of Independence.

Wednesday was the seventy third anniversary of that *Day* when the patriot fathers of the revolution proclaimed the original thirteen colonies "Free and Independent." In the whole history of the world, no event has ever occurred like unto that. Other nations hold anniversaries of famous battles, which settled their destinies or crowned them with worldly glory. We too have our battle anniversaries but the glory of America lies in her Declaration of Independence. That instrument was a declaration of principles, individual and collective rights, to carry out which, every *signer* pledged his life, honor and fortune. Well may America love the memory of those men who gave immortality to that instrument, an instrument which more than any thing beside, since then, has turned the world upside down. At that period there was only one constitutional government (England,) in the whole world, now we have three or four Republics on our own Continent, and all the colonies are but a few paces from the same state. In Europe, where in 1776 England alone had any thing like a constitution, now what do we behold? No less than eight or nine constitutional governments and a number of republics. But from the contour of passing events there, we fear that despotism will yet for awhile press with her iron heel upon the bosom of freedom. The days of her iron cruel glory however, are numbered, she must yet fall and give place to the might of right. We have but little faith in the propheey of Napoleon, that "in half a century Europe would either be Republican or Cossack." Cossack, she never can be—the Cossack will yet be himself a freemen. Many years may elapse before this takes place. The strength of a despotic government lies in the ability of the despot. Let a fool be placed on the throne of Russia and what would she be? A chaos resembling a den of different wild beasts.

The principles of the American Declaration of Independenee, must triumph over crowns and sceptres, and triumph in the hearts of men. The principles contained in it can never die. They find a response in every truly human heart, and these principles will rust the chains of despotism until they become weak as the *withes* that bound Samson. Some despots chains may be thicker than others, and some may be made of less corrosive materials, but if they are not all made of the moral principle, that "governors derive their just powers from the consent of the governed," they will assuredly be severed some day hence.

We seldom say any thing upon national questions, but this one is a favorite text of ours, and from it we would like to preach a weekly sermon. Not being favored with a pulpit for this purpose, except once every year, we close by the usual way of an application, exhorting our hearers to give not only their sympathies, but the voice of encouragement and assistance to the brave men in Europe who are now struggling against bloodthirsty tyrants, to establish governments based upon the moral principle of elective representation.

Decision in the Telegraph Case.

S. F. B. Morse et al. versus O'Reilly et al. —In Chancery.—Petition to Discharge Order. —The Court, the Hon. T. B. Monroe sitting alone (the Hon. John McKinley being absent) held in substance :—

1. That the electric telegraph of Bain may be used on the line of telegraph in Kentucky, constructed by the defendant O'Reily, without infringing the injunction heretofore allowed in this cause.

2. That the defendant O'Reilly having answered to the charge of contempt committed by him in violating the injunction, the order directing the marshal to take possession of the line of wires of the defendant, for the purpose of preventing further violations, may be discharged and the possession restored, on the defendant's executing a bond in the penal sum of $5,000, with two sufficient sureties, that he will not infringe the Morse patent, and, in case of such future infringement pay and satisfy any decree, that may be hereafter ordered against him in this cause.

3 That the question of the exclusive right of Morse to the alphabet of dots and lines, described in the schedules annexed to this patent, not having been fully argued, and the court not being satisfied that his exclusive right to said alphabet extends beyond the art of imprinting the characters of which it is composed by the telegraphic apparatus by him invented, no opinion is expressed on this matter, but it is reserved for future consideration, if it shall become material.

Lightning Conductors.

Mr. Editor.—An article appeared in the last number of the "Scientific American," claiming to give the true principles of the construction of lightning conductors; and emanating from such a source, will, no doubt, be extensively copied and put in practice.—The directions given in that article, are, I believe, in many respects incorrect, and if carried out in practice will involve an expense without an adequate protection; for both democrats and whigs are in favor of "Home Protection."

There has been much discussion about the utility of conductors, and the best mode of constructing them. Orators have said: "The lightnings of Heaven yielded to our philosophy;" and Poets have sung of Franklin, "who wrested from his grasp the bolts of Jove;" and

"In whose glad name the distant worlds rejoice,
Far as the lightnings shine, or thunders raise their voice."

The Americans believe in lightning rods; but the English, even now, hesitate to acknowledge their utility, (vide Brande's Encyclopedia.) Franklin said they should be *pointed* at the top; but John Bull said they should have a *knob* on the top; so no wonder they found them *worse* than useless. At length the Royal Society made a report in favor of Franklin's theory, whereupon they were requested to revise their report, and when the President, Sir John Pringle, replied, in the simplicity of scientific integrity, that he "could not change the laws of nature," he was, for such singular want of "capacity," &c., requested to resign; and he did resign, disgusted with the mean prejudices of those self-styled patrons of science.

But to the practical part: The "American" says they (the conductors) should be of a round form; should be painted black; and that one conductor is sufficient for almost any sized building, provided it extends sufficiently high.

Now, the conductor should not be round; it should not be painted; it should not extend to a great height above the building;—but it should be square, or what is better, a square bar twisted; and it should have *points* two or three inches long, projecting out at frequent intervals, in its entire course from the earth to the top of the building, thence along the eaves, and over the roof, quite round to the rod again. A branch should also extend along the ridge, with points, projecting perhaps three feet above each chimney. It may also, with advantage, extend down the corner of the building. The lower end should be pointed, and penetrate the earth at least six feet.

Why? Because the lightning does not always come from the clouds above to the earth to be pierced by the tall spear erected for that purpose; but it often goes from the earth to the clouds, also laterally from one object to another. But the principal object is to *prevent* large accumulations of either positive or negative electricity, thereby preventing any sudden or violent explosion. The French by similar means, (the *paratonnerre*) prevent the frequent occurrence of hail storms in certain parts of the country.

By means of the points and angular edges of the square or twisted rod, extending quite around the building, an equilibrium between the different electrical states of the earth, atmosphere and surrounding objects is maintained. A Leyden jar cannot remain charged if the top terminates in a point; hence the points and angles both receive and give off electricity with facility. All these points should be tinned or gilded, to prevent oxidation.

The rod should not be painted at all, not even black; for although charcoal is a good conductor, the indurated oil of the paint is not a conductor; hence the advantage of a square rod, points, &c. is lost.

It should not extend to a great height; for the object is not to challenge and invite an enemy, but to prevent him from establishing *depots* of ammunition near our borders.

The authorities of Boston, strongly in favor of "protection," have erected conductors, substantially the same as described above, on all their public buildings, from the city court to the public school house.

In this way alone can a house be completely protected from lightning.

Respectfully yours, N. B. Webster.

[The above is taken from the Portsmouth, Va. Daily Transcript. The article to which Mr. Webster refers was not penned by us, nor was it the one of Mr. Rich, neither did it express our views on the subject. Our columns are always open to calm, brief and clear articles on useful subjects, and the article of Mr. Webster would have been acceptable to the Scientific American, wherein it should should have justly appeared first.

We have only a few words to say respecting it. They are as follows:—

We think it just about as useful to paint an iron lightning rod as to have an old rusty one —they are six of the one and half a dozen of the other. We have no objections to urge against the twisted bar and the way it is employed in Boston—it is a good plan, but the principle of utility in all lightning rods, is the amount of good conducting surface condensed into the smallest possible space. We do not approve of iron rods for conductors.—By the experiments of Dr. Priestley, it has been fully proven that copper is five times a better conductor of electricity than iron. Gold, silver and platinum are far better than copper, but we would choose copper for economy. A copper conductor when worked under the hammer to a fine point, is apt to moulder away in the course of a year or two, therefore to remedy this evil, the copper points should be tipt with platinum. This can now be done very easily by the electrotype. It is needless to go into a discussion of the principles of thunder storms. It is well known that the greatest amount of electricity, which we must guard against, is in the clouds; the discharges from the earth are comparatively few. There is therefore a possibility of philosophers overshooting the mark in the construction of lightning rods, upon the principle of an equilibrium in the discharges between the atmosphere and the earth. The object of all lightning rods, is to invite the electricity and conduct it into some moist part of the earth. If such is not the object of lightning conductors, we want some further explanation of their use—the above article of Mr. Webster is not quite satisfactory on this point.

The opinion of the Royal Society in London, is no more to be taken as the opinion of John Bull on the utility of lightning conductors, than would that of the American Institute in this city be taken for the opinion of Brother Jonathan.

The lightning conductors that are now most in favor in England, and which have been most extensively employed, is what is called the Patent Copper Wire Rope. It can be made of any length, and is adapted to all the angles of buildings, and especially has it superseded all other kinds for the Navy. Sir William Symond has stated in evidence that it was the best, in every sense of the word, for vessels.

European philosophers candidly acknowledge that to "Benjamin Franklin they are indebted for their knowledge respecting lightning conductors."

The poor in Germany use the blossoms of the linden tree instead of tea. It is just as good as tea for them, and far better than the doses of tobacco they partake of in the shape of smoke.

Another Aerial Ship.

Solomon Andrews, President of the Inventors' Institute, advertised to the public that he would exhibit a new æriel ship on the 4th. Here is part of the advertisement, it hoes out the "resurrection pills" all hollow :—

"The public are informed that the Inventors' Institute at Perth Amboy, N. J., will exhibit on the 4th of July next, and during that day only, the Aerial Ship now building, and which is to be completed the present Summer. It is now in such a forward state as to show the full size, form and structure, the frame work being complete, and the envelope already procured (wonderful) only to be on, to be ready for its first trial.

It was intended to have given no publicity to this experiment until it made its first trip through the air to New York, but it is now determined to make this one exhibition for several reasons, among which the following is not the least important, viz:—

The recent notices and exhibitions by Messrs. Porter & Robjohn, of New York, of a model, without a large machine to match, so totally different from this Aerial Ship in every respect, make this public exhibition necessary to forestall any doubtful claim which in a successful issue might arise, as in the case of Fitch and Fulton in steam navigation. This machine is so novel we do not believe that any one, who has not been directly or indirectly informed by the inventor, can tell, after he has seen it, what is its motive power, and the *modus operandi* of its locomotion. Whoever shall discover it, and make it known to the undersigned, shall be entitled to, and receive, a share of stock in the invention, (great stock, remarkable generosity.)

We do not propose to exhibit a complicated apparatus, though of considerable magnitude, but what we believe to be a practical and useful as well as novel invention. It is calculated to carry about 1,000 pounds.

The plan of the invention was laid 23 years ago, and a rude model made a flight, 18 years ago, in the open air, to the distance of 200 yards, against a strong wind.

Seats will be provided, and addresses made to the audience during the day. Tickets for admission will be sold for 50 cents each, to admit a gentleman and lady; every additional lady 25 cents. The tickets may be had at the office of the Inventors' Institute in Perth Amboy."

[Wonders will never cease. Solomon hath said "there is nothing new under the sun." He probably never heard of the Inventors' Institute at Perth Amboy, N. J. This Institute has an extraordinary existence, which many consider to be the very opposite of a "fixed fact," and the flight of this ærial ship may well come under the same category.

Cholera Mixture.

Chalk mixture,	:	6½ oz.
Tincture of Rhubarb,	:	½ oz.
" Ginger,	:	2 oz.
" Opium,	:	2½ oz.
Aromatic spt's of Ammonia		½ oz.

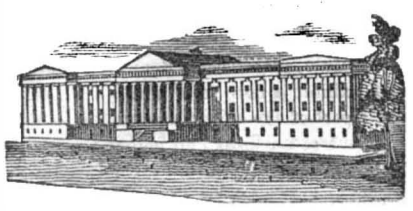
of the above make a mixture. A tablespoonful to be taken every hour when required.

The above receipt was the most successful in the treatment of Cholera in the City of Glasgow during its severe visit to that city last year, of this, we have been assured by respectable authority. It is simple and easily prepared, and it accords in a great measure, with the experience of Mr. Stickney, in his article on "motion" in the Scientific American of last week.

American Navigation of the Orinoco.

The steamer Venezuela, which was built at Pittsburgh to run on the Orinoco river, under a grant to an American company from the Venezuelian Republic, has arrived out, and made her first trip. The "natives were astonished" of course, to see a steamer ploughing the hitherto undisturbed waters of their noble river. The Venezuela has given much satisfaction; she ran from Bolivia to Port of Spain, a distance of 500 miles. A letter from Puerto Espano to the Pittsburgh Gazette, states that Dr. Louis Passano, a French physician, had discovered valuable gold mines between Caroni and Orinoco rivers, a day's journey from Bolivar.

© 1849 SCIENTIFIC AMERICAN, INC



LIST OF PATENTS.

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending June 26, 1849.

To Warren Parker, of Putney, Vt. for improvement in Harness adapted to Horse Rakes. Patented June 26, 1849.

To J. D. Mowry and P. L. Hyde, assignees of A. W. Snow, of Norwich, Conn., for improvement in Seats for Railroad Cars. Patented June 26, 1849.

To Daniel Robb, of Sangamon Co. Ill., for improvement in Hill Side Ploughs. Patented June 25, 1849.

To James Thomas, of West Chester, Pa., for improved adjustable platform animal Trap. Patented June 36, 1849.

To H. C. Jones, assignee of Henry Ritchie, of Newark, N. J. for improvement in the Rotating Permutation Plate Lock. Patented June 26, 1849.

To Z. C. Robbins, of St. Louis, Mo., for improvement in Churns. Patented June 26, 1849.

To T. P. Sherborne, of Philadelphia, Pa. for improvement in Extension Tables. Patented June 26, 1849.

To E. Von Heeringen, of Pickensville, Ala. for improvement in Instruments for teaching Music with the Piano Forte. Patented June 26, 1849.

To J. A. Cutting, of Boston, Mass., or improvement in Spark Arresters. Patented June 26, 1849

To Pells Manny, of Stephenson Co. Ill. for improvement in Harvesters. Patented June 26, 1849.

To Thatcher Perkins, of Baltimore, Md., for improvement in the Boilers and Water Heaters of Locomotive Engines. Patented June 26, 1849.

To Jacob Stroop, of Philadelphia, Pa., for improvement in the attachment of Harrows to Ploughs Patented June 26, 1849.

RE-ISSUE.

To Loring Coes, of Worcester, Mass. for improvement in Screw Wrenches. Patented April 16, 1841. Re-issued June 26, 1849.

DESIGNS.

To A. Quackenboss, assignee of S. W. Gibbs, of Albany N. Y. for Design for Stoves. Patented June 26, 1849.

To C. W. Warnick, of Philadelphia, Pa. for Design for Stoves. Patented June 26, 1849.

To S. H. Ransom, of Albany N. Y., for Designs for Stoves, (2 patents.) Patented June 26, 1849.

Gentle Woman.

The great traveller, John Ledyard, has paid to woman one of the most noble tributes ever uttered. "I have observed that, wherever found, woman are the same kind, civil, obliging humane, tender beings. I never addressed myself in the language of decency and friendship to a woman, whether civilized or savage, without receiving a decent and friendly answer. With man it has often been otherwise. In wandering over the barren plains of inhospitable Denmark, through honest Sweden, frozen Lapland, rude and churlish Finland, unprincipled Russia, and the wide spread regions of the wandering Tartar, if hungry, dry, cold, wet, or sick, woman has ever been friendly to me, and uniformly so, and their actions have been performed in so free and so kind a manner, that if I was dry, I drank the sweet draught, and if hungry, ate the coarse morsel with a double relish."

[Mungo Parke, in nearly the same words, adds the same testimony to woman's kindness, that Ledyard does.

New Calculating Machine.

Two miserable poor young men, residing in an obscure village, in the department of Isere, in France have succeeded, it is said, after ten years' labor, in completing a calculating machine declared to be superior to any yet invented. The Academy of Sciences have issued a most "eulogistic report" on it.

For the Scientific American.

The History of Steam Navigation.

How many strange fancies must float through the mind of the man who is confined to the circumscribed limits of some ocean island.—How many curious visions must be painted on retina of his mental eye as he stands upon the sea shore evening after evening, gazing upon the wide wilderness of waves before him or upon the majestic clouds that skirt the distant horizon. Surely his soul must go out in longing to visit some distant untrodden shore, and perhaps like the enchanted islands seen only by the eye of the seer, he has pictured distant hills and and vast cities in the fantastic forms assumed by the vapors rolled up behind the setting sun. If there was no bark to navigate those troubled waters, the islander would indeed feel, like a prisoner doomed to the narrow precints of his cell. But the art of navigation is coeval with the flood our grandfather Noah being the first navigator. The ancient Phœnicans were the most celebrated of the old navigators—then came the Greeks, and then the less sailor like Romans. When the Romans visited Britain our ancestors used to navigate the straits of the sea in boats made of skins. The old vessels were very rude, but improvement in the art of ship building has been onward since that time.

Commerce is one grand means of civilization, it brings distant nations to know one another, and to know one another for the better. Every invention that tends to bring distant nations nearer together, to make the inhabitants thereof exchange their thoughts freely with each other, is one grand means of bringing about that period when man to man the wide world o'er shall "brothers be." Viewing this question in that light, we claim the invention of the Steam Boat as one of the grandest means for spreading civilization, that has yet been discovered. Its history then has many claims upon our attention, and as it is a subject which touches and brings honor to America, we feel a deep interest in it on that account.

The first account which we have of steamboat propulsion was that of a naval officer under Charles the 5th of Spain in 1543, who is stated to have propelled a vessel of 200 tons burden by steam in the harbor of Barcelona, no account of the machinery has been transmitted to us, except that he had a large copper boiler, and that paddle wheels were suspended on the sides of vessel. Like all old inventors, he refused to explain the mechanism. The account of this invention was furnished for publication by the superintendent of the Spanish Royal Archives, but as it did not appear until steam navigation was fully established after 1807, it must be received with all due allowance for originality, but no as detracting one whit from the well earned laurels of our more modern steamboat inventors. The name of the Spanish inventor was *Blasco de Garay* who before the Emperor made a trial of his steamboat in Barcelona harbor on the 17th of June 1543. The invention in all likelihood was the application of Hero's rotary engine to propel the paddle wheel, but whatever it was, it died with the inventor and his claims cannot be allowed to interfere with others, whose inventions in all their parts have been placed on record.

The establishment of a Patent Office if it does no more good than to record inventions is invaluable on that account. The English Patent Office settles the question of the first steamboat inventor. In 1736 Jonathan Hull, (quite a Yankee name indeed) took out a patent for propelling vessels by steam. In 1737 he published a pamphlet wherein he gives a plate representing a boat with the wheel attached to the stern, driven by a steam engine and tugging behind her a vessel of war. This is certainly the first representation of a steamboat on record. Hulls (poor fellow) met with much opposition from prejudice, and as the steam engine was then but a miserable machine, it does not appear that he prosecuted his invention after the time stated, nor could much be expected from it, as the single acting steam engine alone was known at that time, and by it there was no possibility of producing anything like a regular motion by the application of a crank.

After Hulls, the project of propelling vessels by steam appears to have slumbered for a long time—even for half a century, when the marquis de Joffrie in 1782, made a steamboat 140 feet long, and 15 feet wide and tried it on the Loire at Lyons, in France, but it was not successful. In 1788 John Fitch of America made drawings and a model of a steamboat, the first in America undoubtedly, and considering the events of his invention, and the enthusiasm which John Fitch exhibited, his life deserves more than a passing notice. John Fitch was a native of Connecticut, born 1743, and first learned the trade of clock maker, a trade than which, there is not its equal for whetting mechanical genius. After John Fitch was married for some years, he moved from New England to Trenton, New Jersey, and learned the silversmith trade, and became one of the best silversmiths in the Colonies, and was as highly esteemed for his honesty. He was so industrious and did such a good business, that when the revolutionary war broke out, he had a clear property of £800. This was a great sum in those days. After the war broke out the silversmith business was at a discount, but his ingenious mind found a new way of employing his hands and serving his country, in making and repairing muskets.—During the revolution he removed to Bucks County, Pa., in which he continued to reside after the revolution, and where in 1785 he made a model of a boat to be propelled with steam and with paddle wheels like those now in use. The machinery was made of brass and the paddle wheels of wood. This model with suitable drawings was deposited with the American Philosophical Society in Philadelphia in the month of September, 1785. It was removed ultimately to the Patent Office a Washington, but destroyed with that office in 1836. John Fitch was not only the first inventor of the double paddle wheel steamboat, but was a truly original inventor of the steam engine, to him his steam engine was entirely new, he knew of no other and he thought he was the first steam engine inventor in the world until he disclosed his idea to a Mr. Irwin, a Presbyterian clergyman of Neshaming, Pa., and he was much chagrined by being shown drawings and descriptions of steam machinery in the Pastor's Library. In 1788 John Fitch in company with a number of others built his large boat the Perseverance for experiment. This boat was propelled by a newly patented set of paddles invented by Mr. H. Veight a skillful engineer and they were used against the opinion of Fitch. This boat run at the rate of 8 miles an hour on the Deleware, but it was subsequently burned and poor John Fitch never got rich enough to buy another. He died in Kentucky in 1798, and he had a darling wish to be buried on the banks of the beautiful Ohio, where "the song of the boatmen might enliven the stillness of his resting place and the music of the steam engine soothe his troubled spirit."

John Fitch was esteemed by many to be a monomaniac, but he foretold that he would not be in his grave more than 20 years till some more fortunate man would receive the honor due to him and that the ocean would yet be navigated by steam's magic power.

To be continued.

Pressnre of the Atmosphere.

Galileo discovered that air was a ponderable body, by weighing a copper globe, open to the atmosphere, and then condensing or pumping more air into it, and weighing it again, when he found the weight increased. Torricelli, however, was the first to apply the discovery to any practical purpose. He observed, one day a well-digger attempting in vain to draw water by means of a common pump, from a well more than 34 feet deep; and it struck him that this failure was not owing to nature's abhorrence of a vacuum, but to the fact that the weight of the atmosphere was equal to a column of water about 34 feet in height, or to a column of mercury 30 inches in height. This discovery was made in 1642; and as the construction of the common pump, and the atmospheric engine, and the principle of the barometer are all practical applications of the discovery, we will endeavor, by pointing out a simple experiment, to render the principle clear to all. It a glass tube, about eight feet in length, be bent in the middle ot the form of the letter V, and filled with mercury, and a piston, fitting air-tight, be forced down one leg of the tube to the depth of about three feet, the mercury will flow over at the other leg; and it will be found that a pressure of about 16½ pounds to the inch of surface (not considering friction) will be required to keep the piston in this position: now, if, while the piston is thus depressed 36 inches, and the other leg of the bent tube is quite filled with mercury, an air-tight stopper be inserted in that leg which is filled with mercury, nearly the whole of the weight necessary to keep the piston in its place before the insertion of the stopper, may be removed; and if the piston be lifted, the mercury will follow it till it stands at the same height in both legs, but no farther; if the piston be entirely removed, the mercury will immediately rise in the stoppered leg until the difference of level in the two legs be equal to about 30 inches. The explanation of this is very simple. We find, that to raise the mercury in one leg, say, 30 inches above the level of the mercury in the other, we must employ a force equal to 15 pounds on the square inch; therefore, whatever raises the mercury to the same height in one leg above the level in the other, must exert the same force, *i. e.*—15 pounds to the square inch. Again, we find that when the stopper is inserted, and the piston partly withdrawn, the mercury immediately returns to same level in both legs,—this is because there is a vacuum produced in both legs; but when the piston is entirely withdrawn, the mercury instantly rises in the stoppered leg of the tube until the difference of level is about 30 inches; this must be owing to the pressure of the atmosphere upon the surface of the mercury in the open leg *only*; and, it having been shown that a pressure equal to 15 pounds on the square inch was required to cause the same difference in level, it is evident that the weight of the atmosphere is equal to 15 pounds on the square inch of surface. From this demonstration we at once perceive that the barometer merely points out a change in the weight of the atmosphere in the particular locality in which it is suspended; if a barometer be carried up a mountain, the higher it is carried up the lower the mercury falls, owing to there being less weight of atmosphere above it, or acting on the surface of the mercury at the open end of the tube: thus, suppose, on a certain day, when the mercury stands at 30 inches in one place, it were found to stand at 28.91 on a hill in the neighborhood, this would show that the difference of level in these two barometers was equal to 1,000 feet. The following table expresses the height above the level of the sea, corresponding with the different heights of the mercury in the barometer, when the barometer at the surface of the sea indicates 30 inches:—

At 1000 ft. above the surface of the sea	28.91
2000 " : : :	27.86
3000 " : : :	26.85
4000 " : : :	25.87
5000 " : : :	24.93
1 mile : : :	24.67
2 " : : :	20.29
3 " : : :	16.68
4 " : : :	13.72
5 " : : :	11.28
10 " : : :	4 24
15 " : : :	1.60
50 " : : :	0.95

From this table it may be perceived, that at the height of little more than three miles we should have but one half the weight of the atmosphere above us; and, as water may be raised by the pressure of the atmosphere, as in the common pump, to about 33 or 34 feet at the surface of the sea, a little more than three miles high on a mountain a pump would only lift water to the height of half that, or about 17 feet.

The decay of manufactures in Dublin has been the subject of much irrelevant discussion. The truth is, that it has no single requisite for their successful prosecution, being without coal, and without the command of water power.

"It is very curious," said an old gentleman to his friend, "that a watch should be perfectly dry when it has a *running spring* inside."

© 1849 SCIENTIFIC AMERICAN, INC

TO CORRESPONDENTS.

"O. P. S. of Ohio."—We should think your plan entirely new, and useful, and we do not think machinery for the purpose has ever been patented. You had better forward a model as early as convenient, and we will give it more attention. $2 received and credited as per request.

"G. A. of Geo."—You may depend upon it, that your plan will never succeed, to your satisfaction. Balloon experiments are fast losing ground in the estimation of truly scientific men. We have been denounced as *scientifically* ignorant because we took ground against the plan originated here this season. We have survived, however, and the balloon stands a monument to the memory of fallen greatness, as we predicted it would. At present we are very well suited with the speed of the iron horse. $2 received and the paper sent.

"J. W. C. of Ind."—The model of your Mowing machine has been received and examined. We do not think it sufficiently novel to warrant you in applying for a patent.—Machines for this purpose now in use, appear better adapted to perfect work than yours.—We are of the opinion that an experiment to test its operating value will convince you that it will not do. We expect advices from your application soon, and shall be very much mistaken if they do not prove favorable.

"J. W. C. of Ind."—Yours of the 22d ult. came too late for this week.

"A. K. of Mich."—We can send you the numbers wanted of Ewbank's Hydraulics for 25 cents each. If you should order them be explicit in stating what numbers you want.

"I. S. of N. Y."—The contents of your letter of the 28th ult., has been examined.—The "hollow cast iron pillar with the peculiar form of the teeth," does not constitute the legitimate subject of a patent, but if the manner by which they are held and worked is new, a patent could be obtained for it. The point of "novelty" is better decided by a model, and if you think the part referred to worth the expense of an application, you can send us a model

"W. H. B. of N. Y."—We have never directed our attention to the subject you speak of and therefore cannot give you the exact information. The Mayor will be able to give you the information at once, at least to tell you where the Inspector can be found.

"G. B. S. of N. Y."—Some time in the month of January last, we examined thoroughly into the principle of your machine and gave an adverse opinion of its operating value. A gentleman from Albany writes us that we were correct, and that its defects cannot be overcome, it is an entire disprovement, therefor we hope you will not persist in it. You had better withdraw the funds in our possession, and not apply for letters patent.

"C. B. of Ala."—The instrument you refer to must be "Wollaston's Reflecting Goniometer." It consists of a brass circle graduated on the edge, and furnished with a vernier by which the divisions may be read accurately to minutes. It is an excellent instrument, the indications being correct within the fraction of a degree. It is also applicable to the measurement of crystals of very small size.

"W. H. of Mass."—We are very much obliged to you for the long article upon "Millerism;" we cannot publish it, as it is altogether out of our line. We doubt not the sincerity of your motives, but we trust that the end is not yet. We hope to live a little while longer upon earth and be better prepared to go when summoned.

"S. H. P of N. J."—Your subscription expires with No. 45, and we are glad to hear that so large a number of your friends are about to subscribe. The Sci. Am. is read by thousands of mechanical and scientific men, and is consulted extensively for the thorough practical knowledge always found in its columns.

"R. P. H. of Ind."—You are very much mistaken in your calculations, an experiment would satisfy you of its impracticability. A plan was originated here in 1841, to buoy up a boat with a large balloon filled with hydrogen gas, called the Dove, to sail to Albany in 4 hours, but it did not work. It is impossible to contain hydrogen gas in a vessel for any considerable length of time.

"A. G. of Va."—We know of no patent on the endless belt seperator, this is common property for any machine, nor do we know of any on the inclined board, all these, so far as we know must be common property. We think you can get a patent for your grate, but not for the rest, but as combined.

"R. S. T. of La."—We shipped 2 Camera Lucidas and 6 copies of Cook's Condensing Engine, per the bark "Lucy Ann," which sailed from this port last Monday.

"E. B. W. of N. H."—The model of your machine for Heading Ship Spikes, has never come to hand. The funds which you sent us are deposited to your credit, and we should like the model that we may proceed with your business.

"G. W. P. of Mass."—The specification of your improved Shuttle Motion, was forwarded to you for signature more than a month ago. Why do we not hear from you?

"M. S. and W. P. V. of Me." "W. & P. of Pa." "D. V. of N. Y." and R. S. T. of N. J."—Your specifications have been forwarded to you for signing since our last issue, and we hope you will execute them early and not delay in returning them to us again We hate procrastination.

Money received on account of Patent Office business since June 27:—

J. M. of N. Y. $30. W. H C. of Ala. $46 N. & Co. of N. Y. $32 L. S. E. of Pa. $50. and H. B. of Ct. $40.

PHILADELPHIA, June 26th, 1849

DEAR SIR.—I am in receipt of yours of 23d, inst. Gold has been found in considerable quantities in the banks and beds of streams, which roll into the Sacramento to San Joaquim, and I have no doubt but a diving bell properly constructed, may be used to advantage, and I see no reason why yours should not answer the purpose The water is not deep but, often rapid and the gold frequently lies in the interstices and sharp cavities of the rocks which pave the bottom, over them an ordinary dredging machine will glide and leave the gold behind—it has to be picked out with sharp pointed knives, and frequently pockets are found where eddies have been and now prevail, containing deposits of gold; these can be reached by a properly constructed diving bell, and in no other way, except by diverting the streams which would involve an immense amount of labor. The streams, which you will be able to work to the best advantage are Feather river, Yubee river, the North, South and Middle Forks of the Americans, all these streams roll through banks and over beds which contain rich deposits of gold.

Wishing you every success in your enterprise, I remain very truly yours

WALTER COLTON.

DR. J. R. WORSTER,
Merchants Exchange, New York.

Advertisements.

TO FURNACE MEN, IRON FINISHERS, AND OTHERS

WANTED.—An active partner in an Iron Foundry and Finishing Shop. Any person practically acquainted with the Furnace business would find this a good investment, as he can come in on easy and reasonable terms. The concern has been established six years and is doing a good business. It is worked by water power and well furnished with patterns, lathes, &c.

Apply by letter (post paid.) JOHN LLOYD,
j7 3t* Saint Charles, Illinois.

TO INVENTORS.

THE SUBSCRIBERS offer their services to persons wishing to obtain patents in the United States or in foreign countries, and will prepare specifications and drawings and take all necessary steps to secure a patent.

From their long experience as practical mechanics, added to a thorough knowledge of the Patent Laws and acquaintance with the details connected with the business of the Patent Office, they trust they will be able to give satisfaction to their employers, both in the clearness and precision of their specifications, and in the promptness and ability with which they transact all business entrusted to them,

Persons residing at a distance may procure all necessary information, have their business transacted and obtain a patent by writing to the subscribers, without incurring the expense of a personal attendance at Washington.

Models can be sent with perfect safety by the expresses.

Rough sketches and descriptions can be sent by mail.

For evidence of their competence and integrity they would respectfully refer to all those for whom they have transacted business.

Letters must be postpaid. Office on F st. opposite the Patent Office, P. H. WATSON.
j30 4t* E. S. RENWICK.

The attention of Railroad, Steamboat and Manufacturing Cos. is invited to J. Cumberland & Brother's

PATENT WHITE METALLIC OIL,

FOR steam engines and heavy machinery of all kinds. For its durability, purity from gum, and superior anti-friction properties, as well as its great economy, it has received the approval of the following gentlemen:—

Messrs. John Corell, Congress Steam Mills, 172 Forsyth st.; J. P. & Thos. Cummings, Chelsea Mills, 25th st.; Hecker & Brother, Cherry st; John Jewett & Sons, 182 Front st.; R. Hoe & Co. Sheriff st.; James Payne, Brooklyn City Mills; James E. Fairbanks & Co, and many others who have been using it a long iime with entire satisfaction.

Manufactured by J. Cumberland & Brother, Patentees, Elizabethport, N. J., to whom orders from a distance should be addressed.

ANDREWS & JESSUP, No. 70 Pine st. New York, Agents, have constantly on hand both the Fluid and Hard Metallic Oil, put up in one to five gallon cans and barrels, at the Manufacturers' Prices. j23 4t*

WANTED.

TWO or three first rate Millwrights, of capacity and experience, to go South; a healthy location
Apply to J. G. WINTER, SON & CO.
j7 3t* 54 Wall st, New York.

WATER WHEEL FOR SALE.

A Breast Wheel about 10 feet diameter and 20 feet long with elbow buckets, built of the best materials, in a thorough and workmanlike manner, and has been in use about one year, For particulars address E. GORDON,
j23tf Taunton, Massachusetts

NOTICE.

☞The Second EXHIBITION of the MARYLAND INSTITUTE for the Mechanic Arts, will be held at Washington Hall, in the City of Baltimore, from Thursday, 27th of September. to 13th October, inclusive. Machines, models, or goods sent to the address of H. Hazelhurst, Corresponding Ssecretary of the Institute, (expense paid) will be met with immediate attention, and every facility used to exhibit the same to the best advantage. j16 4m

WATER POWER.

A Valuable Water Power capable of doing an extensive business, situated in Norwalk, Conn, is offered for sale. Enquire of L. M. Stevens, No. 146 Pearl St. New York. or of
J CAMP, JR., or W. C. STREET, Norwalk, Ct.
Norwalk, Ct., June 6, 1849. j16 4t*

A NEW PATENT MACHINE.

HAVING obtained a patent for a self-feeding machine to saw wood TWICE IN TWO at one operation, a model of which can be seen by applying to P. H. Watson, Patent Attorney, Washington, D. C I am now prepared to sell the right for the same, by States or smaller districts, as may best suit the convenience of purchasers. As this is a machine every where wanted, and believed to possess superior merit, it will be to the advantage of mechanics and patent dealers to attend to it.

All communications post paid, and addressed to the subscriber, will receive prompt attention.
DAVID BONNER,
j2 8t* Greenfield, Highland County, Ohio.

MACHINERY.

THE undersigned have made such arrangements with Foundries, Machinists and Patentees, that they are prepared to furnish all kinds of machinery or mechanical tools at manufacturers prices. Steam Engines of any power, Horse power, Lathes, Mills of all kinds, Presses, Planing & Shingle machines, Mill and circular Saws, and every kind of machine or Tool, used by a mechanic or manufacturer. Also a lot of second hand machinery for sale low.

N. B Our personal attention given to forwarding and packing. NORCROSS & CO. 60 Nassau st.

TO SOUTHERN AND WESTERN MANUFACTURERS.

THE undersigned having completed his engagement with the Bay State Mills at Lawrence Mass. is now prepared to negociate with parties for a situation as practical engineer and superintendent of machinery. Strong letters of recommendation can be furnished from Samuel Lawrence, Esq., Messrs. Aldrich, Tyng & Co. of Lowell, and several other gentlemen of high standing. Letters addressed to me at Andover, Mass. will meet prompt attention.
2 6t* T. C. FRYE.

ADIRONDAC AMERICAN CAST STEEL.

A new and VERY SUPERIOR ARTICLE fully equal to any European Steel in the market, for sale at the Company's Warehouse.
QUINCY & DELAPIERRE.
m26 3m* 81 John St. New York.

MORSE'S AIR DISTRIBUTOR.

Detroit Foundry, May 20, 1849.

THE undersigned are the sole agents for the manufacture and Sale of Morse's Air Distributors for Michigan and vicinity. With the above improvement, Tanneries can use the WET TAN as it comes from the vat, and Saw Mills can use ALL KINDS of SAW DUST or wet bark and make Steam as readily as with wood, on the common grate.

Fourteen sets are now in use in Mills and Tanneries in this vicinity, and give abundant satisfaction. Numerous certificates of their great economy in the use of fuel are received from every place where they have been used. DEGRAFF & KENDRICK.
m26 2m

MARDEN'S IMPROVED BALANCE CURTAIN FIXTURES.—Patented Oct. 1848.

FOR Sale wholesale, by J. A. D. Worcester, No. 43 Main st., near the City Square, and by the subscriber, GEORGE H. MARDEN,
j9 3m* Charlestown, Mass.

PATENT AGENCY.

SAMUEL C. HILLS, No. 43 Fulton street, N. Y. Patent Agent and Agent for the sale of Patent Goods and Patent Rights—still continue to aid and assist inventors in procuring Patents and selling Rights. Charges moderate. Application per mail must be post paid. m26 tf

HITTINGER & COOK.

BLACKSMITHS, Shipsmiths, and Machinists.—Fence and Balustrade Work. All kinds of Ice Tools constantly on hand. Ice and Express Wagons built to order. Also, Trucks and Carts, all kinds of Railroad Work, Mill Work, Shafting, &c.
Chamber st, near the Square, Charlestown, Mass.
j9 3m*

SUPERIOR TURNING LATHES.

JAMES STEWART, 15 Canal-st. and 106 Elm-st. is constantly manufacturing and has now on hand between 50 and 60 superior lathes of the following descriptions and at reasonable prices. namely:
Dentist's Lathes, very highly finished.
" " common,
Brass and Wood Turner's Lathes.
Jeweller's and Pencil-case maker's very superior.

J. STEWART is also authorized to act as agent for the sale of the celebrated Lathes manufactured by James T. Perkins of Hudson, of large size and at prices from $250 to $800. A specimen of this description may be seen at his factory as above.
j27 tf

BRITISH PATENTS.

MESSRS. ROBERTSON AND CO.,
PATENT SOLICITORS.

(Of which Firm Mr. J. C. Robertson, the Editor of the Mechanics Magazine from its commencement in 1833, is principal partner,) undertake

The Procuration of Patents.

For England, Scotland, Ireland, and all other European Countries, and the transaction, generally all business relating to patents.

Instructions to Inventors can be had gratis, on applying to Mr. THOMAS PROSSER, 28 Platt Street New York; as also the necessary forms of Petition and Declaration for British Patents.

PATENT OFFICE
m1 tf 166 Fleet Street, London.

SUPERIOR ENGINE LATHES.

WE are manufacturing and selling at our establishment in New London, Ct. a superior article of Screw Engine lathes and also hand lathes of every dimension at an extremely low price.

Address ALBERTSON, DOUGLASS & CO.
Post Paid [d2 6m*] New London, Ct.

Z. C. Robbins,

Consulting Engineer and Counsellor for Patentees.

Office on F street, opposite Patent Office, Washington, D.C. j20 tf

FELTING MANUFACTORY.

JOHN H. BACON.

(Late of the firm of R. Bacon & Sons.)

☞Manufacturer of Feltings for Water Filters, &c., Steam and Water Pipes, Emery Wheels, Calico Printers', Jewellers', Marble Workers' Boot Felts, Felting for Railroads, &c. &c. Also Lambs Wool Wadding for Cloaks, Skirts, Hoods, &c.

For sale and orders received by T. C BACON & CO., corner of Union and Ann sts., also by E. C. TURELL, No. 26 Ann st. Boston, next door to Oak Hall. a7 3m*

Johnson's Improved Shingle Machine.

THE Subscriber having received Letters Patent for an improvement in the Shingle Machine, is now ready to furnish them at short notice, and he would request all those who want a good machine for sawing shingles, to call on him and examine the improvements he has made, as one eighth more shingles can be sawed in the same given time than by any other machine now in use. Manufactured at Augusta, Me. and Albany, N. Y. J. G. JOHNSON.
Augusta, Maine, Oct. 28, 1848. o28 1y
☞Messrs. Norcross & Co. No. 60 Nassau st. New York, are Agents for the sale of my Shingle Machines.

"ATTENTION THE WHOLE."

CITIZENS and Strangers are respectfully invite to visit GURNEY'S DAGUERRIAN GALLERY 189 Broadway, where Likenesses of the finest finish and most durable materials are taken in clear or stormy weather.

N.B.—Paintings, Daguerreotypes, Engravings, &c. copied. m31 3m*

E. NEVILLE, WOOD ENGRAVER.

122 Fulton st. corner Nassau.

☞The above is prepared to execute all orders at he shortest notice and on the most reasonable terms

TO PAINTERS, &c.

QUARTERMAN'S **Improved American Atomic Drier**, adapted to all kinds of Paints and Painters' colors. Sold wholesale and retail, at 114 John st New York.
m19 3m* QUARTERMAN & SON.

FAY & GULICK,

Designers and Engravers on Wood, No. 80 Nassau street, Room No. 25. m12 tf

Barlow & Payne,

Patent Agents and Consulting Engineers,
89 Chancery Lane, London.
m26 tf

Lap welded Wrought Iron Tubes

FOR TUBULAR BOILERS,

From 1 1-2 to 8 inches diameter.

THESE are the only Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers. THOMAS PROSSER, Patentee,
m1 28 Platt street, New York.

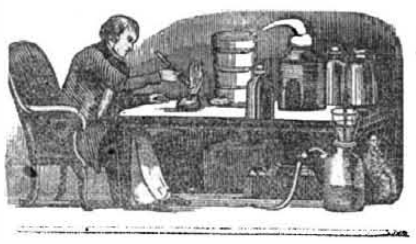
PROFITABLE EMPLOYMENT.—AGENTS WANTED.

YOUNG MEN will find it to their advantage to engage in the sale of valuable and popular Books, on useful and interesting subjects. Also, to canvas and obtain subscribers for a Monthly Journal, which should be in the hands of every working man in the nation. Such terms will be offered as to make it an inducement for all (not already profitably employed) to engage in this enterprise. For particulars, please address, post paid,
FOWLERS & WELLS,
m19 8t 129 and 131 Nassau st. New York.

TO INVENTORS.

THE Subscriber begs leave to inform inventors and others that he manufactures working models of machinery &c. in a neat workmanlike manner. Patterns of every description made for Castings.—Scroll Sawing neatly executed. Mathematical and Nautical Instrument Cases of every description.
JOSEPH PECKOVER, 240 Water st. N. Y.
j30 3m* Between Beekman st. and Peck Slip.

© 1849 SCIENTIFIC AMERICAN, INC



For the Scientific American.

Patent Laws and Business.

I have endeavored to show conclusively that the object of the Law of Patents was to cover a very extensive field for the encouragement of the Arts in the Republic. I have also thrown out some very broad hints against the narrow mindedness of some Patent Office decisions. There is certainly a great reform wanted both in the management of the Office and in our U. S. District Courts too In the latter place—it is correct information, in the former, a right spirit.

Many applications for patents which have been rejected at first, have afterwards been granted, and no doubt many original and good inventions have been too hastily rejected—inventions which might have been secured by patents had the inventors persisted in their applications. These rejected applications are filed in the Patent Office, and many new applications are rejected, and the inventors *wisely* referred to the said rejected applications for reasons of the new rejections.

This is certainly not right. The claim or claims of the previous rejected application, should be sent along with the reason of rejection. The Patent Office has a fund which can well be spent for the salary of an extra clerk, to give more information than it does in such cases. Let the Patent Office give as much information on such subjects as possible, and more satisfaction will be rendered to rejected applicants, and beside, it may save considerable to inventors in applying to agents to get the information for them, or paying the Patent Office for copies of the rejected applications

I have been informed, that a better and more candid spirit, has recently distinguished the answers to rejected applicants. This is as it should be, for, although many very absurd things, alleged as improvements, may be presented for patents, still the inventors, the majority of them at least, are sincere, and the child of invention to each man's mind, is the greatest favorite, of course, be it a sickly or sturdy nursling. Inventors should be guided by a generous spirit in reference to their rejected applications also, and not find fault without a cause.

One great benefit to inventors would be the ready means of obtaining information respecting what has been patented—what is new and what is old, so that they would expend as little as possible on old projects to reinvent them. I for one appreciate the tone of an article in vol. 2 Scientific American, which exhorted the Smithsonian Institute to publish an elaborate work on American patented inventions. The article was so free from the taint of selfishness and exhibited such a good will both to inventors and the public, that I was led to admire, yea more than admire, the spirit that indited it. It would be well now, if the hints then thrown out, were acted upon, for it is morally impossible that any man can, in the present state of things give correct information to an inventor, regarding the novelty of an improvement. The reason of this is, that the Patent Office sometimes rejects applications on the ground that they have been described in *Rabelais*, a work in a foreign language and more than two centuries old, and of which, there is not perhaps more than two copies in the United States.

It would be well to extend the patent law to the introduction of new machines and manufacture, and the necessity and policy of this action was recommended by Mr. Burke, the late Commissioner of Patents, in reference to the making of Russia Sheet Iron. We hope to see this principle carried out—that a reform will be made in our patent laws to grant a patent to a citizen who introduces something new and useful, if he is not the inventor.—Full justice might be done to foreign inventors, by allowing them to assign to the citizen introducing, or else, allow one year for the real inventor to make the application. Here we would have a wide, new and useful field laid out before us that would be a great benefit to us as a nation, for it would be a premium paid to gather into the ample folds of our starry flag, the useful arts of every nation in the world As this republic is yet more fully to be the centre of civilization, why should we not extend the means to accomplish this grand object in the shortest possible space of time. Physical discovery cannot be separated from progressive civilization—for those nations most distinguished for invention and discovery have been, and are, the most civilized.

JUNIUS REDIVIVUS.

Straw for Bonnets.

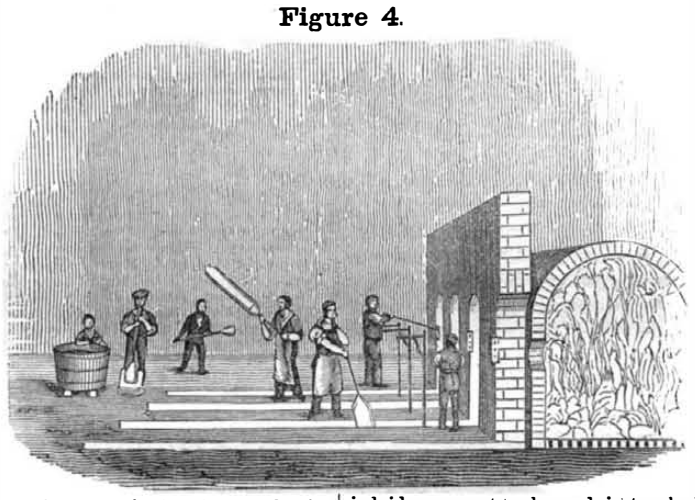
Cut wheat or rye straw while in full blossom, or as the blossoms begin to fall. Scald in a few hours after it is cut, (the head being first cut off,) in boiling water, about a quarter of a minute, then spread and dry it in the sun ; take care that neither rain or dew fall upon it. It will cure in three days sunshine. Then keep it in a dry place. To split the straw after it is properly cured, so as to reduce it to a proper texture, it is only necessary to fit the point of a penknife in a piece of board, leaving about the eighth or a fourth of an inch above the board, then pulling the straw against it. Splits of any size can be made.

Manufacture of Glass.

(*Continued from page* 328.)

A representation of the Glass Furnace is hereby given in fig. 4. It shows the arrangement of the circular apertures and grooves, as well as the position of the workman during this part of the process. The parallelism of the sides of the tubes or cylinder is maintained by adjusting exactly the quantity of air blown into it ; whilst the circular shape, straightness, and proper thickness of the sides and ends are secured by skilful management of the vibrations, and by a continued motion of the pipe on its axis, which from the time it is first plunged into the melted glass, until the cylinder is completed, is never stopped for an instant. Being thus made of about one half the desired length, the half formed cylinder resembles in shape a cylindrical high pressure boiler with hemispherical ends, attached at one end to the pipe end of the cylinder, and the bottom of the bottle to the end of the cylinder which is used when French shades are made, but is burst open in making German sheet. The cylinder is re-heated in the same furnace, but the bottom being too thin to elongate in a regular manner by its own weight, recourse is had to centrifugal

Figure 4.



force, the workman swinging it round, the effect of the motion being to pull out the soft glass to the length required, advantage being taken of that law of centrifugal force, by which bodies tend to fly off from the centre in direct proportion to their distance from it.

It will be readily imagined, that a man whisking about a red hot mass of glass, of nearly a yard long and a foot in diameter, apparently in a very careless and easy manner, presents not only a most curious spectacle, but one well calculated to inspire the beholder with the fear that the man will let go his hold of the thin and weak looking pipe, or that some cracking of the glass may allow a portion of the glowing mass to fly amongst the workmen in the vicinity. But accidents are of very rare occurrence, and the consummate skill of the workmen enables them to execute feats which require not only extraordinary tact, but also great bodily strength, with elegance and ease. In reality the various operations of glass blowing are a constant succession of feats of sleight of hand, and though the almost unerring certainty with which they are performed, may at first sight remove the appearance of difficulty, yet upon reflection one can hardly sufficiently admire the extraordinary skill and dexterity which are absolutely necessary to ensure success.

The cylinder is now of the right length, diameter and thickness, but is closed at the end ; to open this, the pipe, close to the neck of the cylinder, is supported on a small crane and the closed end is held at a short distance from the fire; the extreme point thus becomes exceedingly hot and soft, so that by forcing air into the cylinder, the softened part expands, and becoming gradually thinner, at length bursts, leaving a hole of about two inches diameter ; the cylinder being again heated for one third its length, is withdrawn from the furnace and hung down, having at the same time a rapid rotary motion on its axis communicated to it, which gradually expands the hole and at length renders the diameter of the cylinder equal throughout.

The blowing being completed, the cylinder is laid across a tressle, and is touched on the neck with a cold iron rod which effects what cold water failed in before, viz. the cracking of the glass ; the short crack thus made is sufficient to cause the neck to separate at that spot, when a slight blow is given to the pipe, and the cylinder remains in this state until the man has finished his day's work. The caps are then cut off by a process exactly the reverse of the preceding, for heat is applied to cold glass instead of cold to hot glass; the workman, by wrapping a cord or rod of red hot glass round the cylinder, causes the cap to crack off at the heated part, the process being sometimes hastened by touching the heated ring with cold water or with a piece of cold iron.

(*To be continued.*)

A Queer Head Dress.

Lynch, in his expedition to the Dead Sea thus describes a queer head dress, which the women about Beyrout wear :

" The most striking peculiarity of dress we saw, was the tataur or horn, worn mostly by the wives of mountaineers. It was 14 inches to two feet long, three or four inches wide at the base, and about one inch at the top. It is made of tin, silver or gold, according to the circumstances of the wearer, and it is sometimes studded with precious stones. From the summit suspends a veil, which falls upon the breast, and at will, conceals the features It is worn only by married ones of the highest rank, and once assumed, it is worn for life. Although the temple may throb and the brain be racked with fever, it cannot be laid aside. Put on with the bridal robe it does not give place to the shroud. * * It is supposed to have some reference to the words, "the horns of the righteous shall be exalted."

Chicory in Coffee.

In a debate in the British Parliament upon the use of chicory (the dandelion root) in coffee, it was stated that the revenue lost more than half a million sterling by its use. It is said that this adulteration improves the flavor of coffee, and corrects its astringent qualities.

Ingenious Lead for Sounding the Depth of Rivers.

Duncan, in his travels through Western Africa, gives the following account of a lead which he invented to ascertain the depth of rivers. He took a bullet and bored a hole through it, and then through that he passed a small line of twine, leaving the lower side of the bullet countersunk, and into this pressed a piece of goat's tallow. The twine is then passed through a very thin piece of wood about five inches square. If the river is very wide, and the crossing made by canoe, the line of course, may be dropped overboard as on board ship ; but if you are obliged to swim the ball may be dropped on the water. The bullet, of course, sinks to the bottom, and draws the twine through the hole in the wood at the same time, till it reaches the bottom ; the line being marked into feet, the depth is accurately ascertained. If a river is not more than forty yards wide, it may also be measured in the same way, by throwing the wood and ball into the middle of the river, taking care to coil the line carefully up previously to throwing it.

This simple apparatus may be constructed and used by any person.

LITERARY NOTICES.

Holden's Magazine for July, is well filled with original and highly interesting matter and is fully equal to any previous issue. The engravings are well executed, abounding with interest. They consist of a view on the Erie Canal near Little Falls ; likenesses of Hans Christian Andersen of Denmark, and Dr. W. B. Sprague of Albany. This number also contains an interesting sketch from a " Free Hand," of the Rev. John Pierpont, and a biography of the Rev. R. S. Storrs, Jr. of Brooklyn. This is the first number of the fourth volume, consequently a favorable time to subscribe.

We have received from W. H. Graham, of this city, the July number of Graham's American Magazine. The embellishments are very rich and beautiful. Among them is "Cross Purposes," a beautiful mezzotint; " Nature's Triumph," " The Widow of Nain," an elegant plate of fashions, and a beautifully executed likeness of Gen. Stephen W. Kearney, accompanied by a well written biography, from the gifted pen of Robinson.

The magazine is in a prospering condition and deservedly so. We commend it to the attention of those ladies who desire to cultivate a taste for good reading.

The Water Cure Journal and Herald of Reforms.

No. 1, vol. 8 of this valuable monthly periodical, published by Fowler & Wells of this city, is just issued, and is a most excellent number. In it is an illustrated description of the whole " Water Cure Process."

THE BEST Mechanical Paper IN THE WORLD !

FOURTH YEAR OF THE

SCIENTIFIC AMERICAN !

416 Pages of most valuable information, illustrate with upwards of

500 MECHANICAL ENGRAVINGS!

☞ The Scientific American differs entirely from the magazines and papers which flood the country, as it is a Weekly Journal of Art, Science and Mechanics, having for its object the advancement of the INTERESTS OF MECHANICS, MANUFACTURERS and INVENTORS Each number is illustrated with from five to TEN original ENGRAVINGS OF NEW MECHANICAL INVENTIONS, nearly all of the best inventions which are patented at Washington being illustrated in the Scientific American. It also contains a Weekly List of American Patents, notices of the progress of all Mechanical and Scientific Improvements ; practical directions on the construction, management and use of all kinds of MACHINERY, TOOLS, &c. &c.

It is printed with clear type on beautiful paper, and being adapted to binding, the subscriber is possessed, at the end of the year, of a large volume of 416 pages, illustrated with upwards of 500 mechanical engravings.

TERMS : Single subscription, $2 a year in advance ; $1 for six months. Those who wish to subscribe have only to enclose the amount in a letter, directed to MUNN & CO.

Publishers of the Scientific American,
128 Fulton street, New York.

All Letters must be Post Paid.

INDUCEMENTS FOR CLUBBING.

5	copies for	6	months	$4 00
5	"	12	"	$8 00
10	"	6	"	$7 50
10	"	12	"	$15 00
20	"	6	"	$15 00
20	"	12	"	$30 00

Southern and Western Money taken at par for subscriptions. Post Office Stamps taken at their full value.

MUNN & CO., Scientific American Office, N. Y.

© 1849 SCIENTIFIC AMERICAN, INC